PT SATRIA SAFIRA BETON
Readymix Concrete - General Contractor - General Trading
Jl. Raya Semarang - Demak Km. 7 Banjardowo Genuk Semarang Telp./Fax. (024) 6584744/45 Email satriasafira2@gmail.com

SURAT KESANGGUPAN JAMINAN PENGADAAN / MATERIAL
No. 0105/SSB/19/SMG/20.5.2019

Y ang bertanda tangan dibawah ini :

1. Nama : EDDY PURNOMO
   Jabatan : Area Manager
   Perusahaan : PT.SATRIA SAFIRA BETON
   Alamat : Jl.Raya Semarang Demak Km-07

Selanjutnya disebut sebagai PIHAK PERTAMA

2. Nama : MAS'UD AZIZI
   Jabatan : Direktur **.CV..BAROKAH JAYA**
   Alamat : **Lingk. Daleman Asri RT.003 RW.004 Mungseng Temang**

Selanjutnya disebut sebagai PIHAK KEDUA

Pasal 1

PIHAK PERTAMA Memberikan dukungan bahan kepada Pihak Kedua sebagai berikut :

Pengadaan Bahan Beton Readymix K – 175
Pengadaan Bahan Beton Readymix K - 350

Untuk paket Pekerjaan Konstruksi **Pembuatan Jembatan Penghubung Gedung A Dan Gedung H Fakultas Hukum Unversitas Diponegoro – Semarang Tahun Anggaran 2019**

Pada POKJA 4 Konstruksi dan Konsultasi UNDIP 2019 Alamat gedung widya Puraya Lt 1 UNDIP

Pasal 2

Pihak Petama akan memenuhi pengadaan bahan seperti tersebut dalam pasal 1 sesuai dengan kebutuhan dilapangan (yang akan dituangkan dalam perjanjian kesepakatan harga antara Pihak Pertama dan Pihak Kedua) Apablla Pihak Kedua ditunjuk sebagai pemenang pekerjaan tersebut.

Pasal 3

Surat Dukungan Pihak Pertama kepada Pihak Kedua bersifat mengikat dan berlaku sampai dengan waktu pelaksanaan berakhir.

Demikian surat Dukungan ini dibuat untuk dipergunakan sebagaimana mestinya

Semarang 20 Mei 2019

Pihak Kedua
CV..BAROKAH JAYA

CV. BAROKAH JAYA

MAS'UD AZIZI
Direktur

Pihak Pertama
PT. SATRIA SAFIRA BETON



EDDY PURNOMO
Area Manager

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STANDAR SPESIFIKASI

Semen Gresik, Portland Cement Tipe I (PC I)

Jenis Pengujian		SNI 15-2049-04	ASTM C 150-02a	Hasil Uji
		PC I	PC I	
Komposisi Kimia:				
Silikon Dioksida	(SiO_2),%	-	-	20,92
Aluminium Oksida	(Al_2O_3),%	-	-	5,49
Ferri Oksida	(Fe_2O_3),%	-	-	3,78
Kalsium Oksida	(CaO),%	-	-	65,21
Magnesium Oksida	(MgO),%	≤ 6,00	≤ 6,00	0,97
Sulfur Trioksida	(SO_3),%	≤ 3,50	≤ 3,50	2,22
Hilang Pijar	(LOI),%	≤ 5,00	≤ 3,00	1,35
Kapur Bebas	,%			0,59
Bagian Tidak Larut	,%	≤ 3,00	≤ 0,75	0,43
Alkali	(Na2O + 0,685K2O),%	≤ 0,60	≤ 0,60	0,19
Tricalsium Silicate	(C_3S),%	-	-	57,82
Dicalsium Silicate	(C_2S),%	-	-	16,36
Tricalsium Aluminate	(C_2S),%	-	-	8,16
Tetracalsium Aluminate Ferrit	(C_4AF),%	-	-	11,50
Pengujian Fisika:				
Kehalusan:				
Dengan Alat Blaine	(M^2/Kg)	≥ 280	≥ 280	320
Waktu Pengikatan dengan alat Vicat:				
Awal	(menit)	≥ 45	≥ 45	148
Akhir	(menit)	≤ 375	≤ 375	245
Kekekalan dengan alat Autoclave:				
Pemuaian	(%)	≤ 0,80	≤ 0,80	0,06
Penyusutan	(%)	-	-	-
Kuat Tekan				
3 hari	(Kg/cm^2)	≥ 125	≥ 122	230
7 hari	(Kg/cm^2)	≥ 200	≥ 194	320
28 hari	(Kg/cm^2)	≥ 280	-	410
Pengikatan semu, (*False Set*):				
Penetrasi Akhir	(%)	50	50	73,79

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Semen Gresik, Portland Pozzolan Cement

Jenis Pengujian		SNI 15-2049-04		ASTM C595-03	Hasil Pengujian
		PPC Tipe IP-U	PPC Tipe IP-K	PPC Tipe IP	
Komposisi Kimia:					
Silikon Dioksida	(SiO_2),%	-	-	-	23,13
Aluminium Oksida	(Al_2O_3),%	-	-	-	8,76
Ferri Oksida	(Fe_2O_3),%	-	-	-	4,62
Kalsium Oksida	(CaO),%	-	-	-	58,66
Magnesium Oksida	(MgO),%	≤ 6,00	≤ 6,00	≤ 6,00	0,90
Sulfur Trioksida	(SO_3),%	≤ 3,50	≤ 3,50	≤ 3,50	2,18
Hilang Pijar	(LOI),%	≤ 5,00	≤ 3,00	≤ 3,00	1,69
Kapur Bebas	,%	-	-	-	0,69
Bagian Tidak Larut	,%	-	-	-	0,82
Pengujian Fisika:					
Kehalusan:					
Sisa di atas ayakan 0,09 mm	(%)	-	-	(A)	
Dengan Alat Blaine	(M^2/Kg)	≥ 280	≥ 280	(A)	325
Waktu Pengikatan dengan alat Vicat:					
Awal	(menit)	≥ 45	≥ 45	≥ 45	153
Akhir	(menit)	≤ 420	≤ 420	≤ 420	249
Kekekalan dengan alat Autoclave:					
Pemuaian	(%)	≤ 0,80	≤ 0,80	≤ 0,80	0,043
Penyusutan	(%)	≤ 0,20	≤ 0,20	≤ 0,20	-
Kuat Tekan					
3 hari	(Kg/cm^2)	≥ 125	≥ 110	≥ 130	205
7 hari	(Kg/cm^2)	≥ 200	≥ 165	≥ 200	290
28 hari	(Kg/cm^2)	≥ 250	≥ 205	≥ 250	385
Panas Hidrasi					
7 hari	(cal/gr)	-	≤ 70	≤ 70 (B)	68,15
28 hari	(cal/gr)	-	80	≤ 80 (B)	78,40
Kandungan Udara	(%)	< 12 [C]	< 12 [C]	≤ 12	6,40

Keterangan: (A) = Sesuai permintaan.
(B) = Berlaku bila diperlukan panas hidrasi rendah atau sedang, dan syarat kuat tekan minimum menjadi 80% dari syarat di atas.
(C) = Bila diperlukan/diminta oleh konsumen atau produsen.

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Semen Tonasa, Super Masonry Cement (SMC)

Keterangan		Hasil Pengujian	Persyaratan Standar	
			ASTM C 91 – 95 c Tipe M	SNI 15 – 3500 – 1993 (Semen Campuran)
Komposisi Kimia:				
Sulfur Trioksida	%	1.85		3 max
Pengujian Fisika:				
Kehalusan:				
- Sisa di atas ayakan 45 u	%	19.43	24 max	24 max
Waktu pengikatan dengan alat Vicat:				
Awal	(menit)	120	90 min	45 min
Akhir	(menit)	230	1440 max	375 max
Kuat Tekan:				
- 3 hari	(Kg/cm^2)	117	≤ 0,80	≤ 0,80
- 7 hari	(Kg/cm^2)	161	-	-
- 28 hari	(Kg/cm^2)	217		
- 7 hari	Psi(MPa)	2289 (15.78)	1800 (12.4) min	
- 28 hari	Psi(MPa)	3028 (20.88)	2900 (20.0) min	
Ketahanan, pemuaian di Autoclave				
Pemuaian	%			0.80 max
Penyusutan	%			0.20 max
Pengikatan Semu (*False Set*)				
Penetrasi Akhir	(%)	96.00		50 min

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Semen Padang, Portland Cement Type I

Keterangan		Hasil Pengujian	Persyaratan Standar		
			ASTM C150-95a Portland Cement Type I	SNI 15-2049-1994 Portland Cement Type I	BS 1370: 1989 Ordinary Portland Cement
I Komposisi Kimia:					
Magnesium oksida (MgO)	%	0.85	6.00 max	6.00 max	4.00 max
Sulphurtrioksida (Al_2O3)	%	1.46			
- ketika $C_3A \leq 8\%$			3.00 max	3.00 max	
- ketika $C_3A \leq 8\%$			3.50 max	3.50 max	
- ketika $C_3A \leq 3.5\%$					2.50 max
- ketika $C_3A \leq 3.5\%$					3.50 max
Total muatan alkali sebagai ekivalen Na_2O	%	0.26	0.60 max *1)	0.60 max *1)	
Hilang pijar	%	1.66	3.00 max	5.00 max	3.00 max
Bagian tidak larut	%	0.29	0.75 max	3.00 max	1.50 max
Chlor (Cl)	%	0.00			
II. Pengujian Fisika:					
Kehalusan:					
- Air permeability test with Blaine app.	M^2/kg		280 min	280 min	275 min
Ketahanan:					
- Pemuaian di Autoclave	%	0.10	0.80 max	0.80 max	0.80 max
Kuat tekan					
- 3 hari	$Kg/cm^2 (N/mm^2)$	170 (30)	122.4 min	125 min	(25) min
- 7 hari	Kg/cm^2 (N/mm^2)	245 (44)	193.8 min	200 min	
- 28 hari	Kg/cm^2 (N/mm^2)	350 (62)	285.6 min *2)	280 min *2)	(47-67)
Waktu pengikatan (Vicat Test):					
- Awal	Menit	105	45 min	45 min	
- Akhir	Menit	230	375 max	375 max	
Waktu pengikatan (Gillmore Test):		0.00			
- Awal	Menit	135			
- Akhir	Jam	4.25			10 max
Soundness expansion (*Le-Chatelier*)	mm	0.00			10 max
Pengikatan semu (*False set*):					
- Penetrasi akhir	%	79.20	50 min.* 2)	50 min.* 2)	

*1) Batas bisa ditentukan jika semen akan digunakan di beton dengan agregat yang mungkin reaktif dan merusak (Jika ada permintaan).
*2) Persyaratan fisika berlaku jika ada permintaan.

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Semen Padang, Portland Cement Type II

Keterangan		Hasil Uji	Persyaratan Standar		
			ASTM C150-95a Portland Cement Type III	SNI 15-2049-1994 Portland Cement Type III	BS 1370: 1974 High Early Strength Cement
I Komposisi Kimia:					
Silikon Dioksida (SiO_2)	%	21.97	20.00 min	20.00 min	
Aluminum Oksida (Al_2O_3)	%	4.15	6.00 max	6.00 max	
Ferric Oksida (Fe_2O_3)	%	4.47	6.00 max	6.00 max	
Calcium Oksida (CaO)	%	64.95			
Magnesium Oksida (MgO)	%	0.83	6.00 max	6.00 max	4.00 max
Sulfur Trioksida (SO_3)	%	2.06	3.00 max	3.00 max	
- Ketika C_3A < 7.0%					2.50 max
- Ketika C_3A > 7.0%					3.00 max
Hilang Pijar	%	1.18	3.00 max	3.00 max	3.00 max
Bagian tidak larut	%	0.28	0.75 max	1.50 amx	1.50 max
Trikalsium aluminate (C_3A)	%	0.00	8.00 max	8.00 max	
C_3S + C_3A	%	55.92	58.00 max *3)	58.00 max *3)	
Total muatan alkali sebagai ekivalen Na_2O	%	0.26	0.60 max *1)	0.60 max *1)	
Chlor (Cl)	%	0.00			
II. Pengujian Fisika:					
Kehalusan:					
- Uji kekedapan udara dengan Alat Blaine	M2/kg		280 min	280 min	275 min
Ketahanan :					
- Pemuaian di Autoclave	%	0.04	0.80 max	0.8 max	
Kuat tekan					
- 3 hari	Kg/cm2(N/mm2)	160 (29)	102.0 min	100 min	(8) min
- 7 hari	Kg/cm2(N/mm2)	215 (38)	173.4 min	175 min	(14) min
- 28 hari	Kg/cm2(N/mm2)	300 (53)	285.6 min *2)	280.6 min *2)	(28) min
Waktu pengikatan (*Vicat Test*)					
- Awal	Menit	130	45 min	45 min	60 min
- Akhir	Menit	270	375 max	375 max	600 max
Pemuaian (*Le-Chatellier*)		0.00			
Hidrasi panas:	Mm				
- 7 hari	Cal/gr	66.80	70 max. *2)	70 max. *2)	59.75 max
- 28 hari	Cal/gr	77.6			69.31 max
Pengikatan semu (*False set*):					
- Penetrasi akhir	%	78.00	50 min.* 2)	50 min.* 2)	

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Semen Padang, Portland Cement Type III

Keterangan		Hasil Pengujian	Persyaratan Standar		
			ASTM C150-95a Portland Cement Type III	SNI 15-2049-1994 Portland Cement Type III	BS 1370: 1974 High Early Strength Cement
I Komposisi Kimia:					
Magnesium Oksida (MgO)	%	0.72	6.00 max	6.00 max	6.00 max
Total muatan alkali sebagai ekuivalen Na_2O	%	0.24	0.60 max. *1)	0.60 max. *1	
Sulfur Trioksida	%	290			
- Ketika $C_3A \leq 8,0$			3.50 max	3.50 max	
- Ketika $C_3A > 8,0$			4.50 max	4.50 max	
- Ketika $C_3A \leq 3,5$					250 max
- Ketika $C_3A \geq 3,5$					3.50 max
Hilang Pijar		1.71	3.00 max	3.00 max	3.00 max
Bagian tidak larut		0.12	0.75 max	1.50 max	1.50 max
Trikalsium aluminate (C_3A)	%	10.11	15 max. *2)	15 max. *2)	
Chlor (Cl)	%	0.00			0.10 max
II. Pengujian Fisika:					
Kehalusan:					
- Air permeability test with Blaine app.	M^2/kg	419			
Ketahanan					350 min
- Pemuaian di Autoclave	%	0.015	0.8 max	0.8 max	
Kuat tekan					
- 1 hari	$kg/cm^2 (N/mm^2)$	156 (28)	125 min	122.4 min	
- 2 hari	$kg/cm^2 (N/mm^2)$	281 (37)	250 min	244.8 min	(25) min
- 3 hari	$kg/cm^2 (N/mm^2)$	396 (50)			
- 28 hari	$kg/cm^2 (N/mm^2)$	510 (90)			(52) min
Waktu pengikatan (*Vicat test*)					
- Awal	Menit	72	45 min	45 min	
- Akhir	Menit	240	375 max	375 max	
Waktu pengikatan (*Gillmore Test*)					
- Awal	Menit	75			45 min
- Akhir	Menit	1.5			10 max
Pemuaian (*Le-Chatelier*)	Mm	0.00			10 max
Pengikatan semu (*False set*):					
- Penetrasi akhir	%	83.30	50 min, *3)	50 min, *3)	

* Portland Cement Type III juga dikenal dengan nama: - *Rapid Hardening Portland Cement* atau
- *High Early Strength Portland Cement*

* 1) Batas bisa ditentukan jika semen akan digunakan beton dengan agregat yang mungkin reaktif dan merusak (Jika ada permintaan).

* 2) Persyaratan kimia pilihan: - C_3A = maksimal 8% untuk daya tahan sulfat sedang.

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- C_3A= maksimal 5% max untuk daya tahan sulfat yang tinggi

* 3) Persyaratan kimia pilihan

Semen Padang, Oil Well Cement (OWC) Class G-HSR

Keterangan		Hasil Uji	Persyaratan Standar	
			API Spec 10A	SNI 15 – 3044 – 1992
I Komposisi Kimia:				
Magnesium Oksida (MgO)	%	0.80	6.00 max	6.00 max
Sulfur Trioksida (SO_3)	%	1.88	3.00 max	3.00 max
Hilang Pijar	%	0.84	3.00 max	3.00 max
Bagian tidak larut	%	0.15	0.75 max	0.75 max
Total muatan alkali sebagai ekuivalen Na_2O	%	0.20	0.75 max	0.75 max
Tricalium Silicate (3CaO SiO_2)	%	57.45	Min 48 – max 65	Min 48 – max 65
Tricalium Aluminate (3Cao Al2		1.87	3.00 max	3.00 max
Tetracalium Alumino Ferrit ($4CAO.Al2O_3Fe2O_3$)		14.41		
Tetracalium Alumino Ferrit ($4CAO.Al_2O_3Fe_2O_3$)+				
Twice Tricalium Aluminate 2 (3CaO Al_2O_3)	%	18.16	24 max	24 max
II Pengujian Fisika:				
Ketahanan				
- Pemuaian di Autoclave		0.001		0.80 max
Kehalusan:				
Kandungan *Free water*	Ml	1.30	3.50 max	3.50 max
Kuat tekan pada 100 F	psi	6.32	300 min	300 min
(waktu pemulihan 8 jam)				
Kuat tekan pada 140 F	Psi	1890	1500 min	1500 min
(Waktu pemulihan 8 jam)				
Thickening time, Sch no.5	Menit	95	Min 90 – max 120	Min 90 – max 120
Konsistensi 15-30 menit	8c	15.40	30 max	30 max

- API Spec. 10A. Twenty – Second Edition, 1 Januari 1995.
- SNI 15-3044-1992 Semen Pemboran

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Semen Tonasa, Portland Composite Cement (PCC)

HASIL PENGUJIAN		SNI 15-700-2004	Produk Semen Tonasa
1.Komposisi Kimia:			
Kandungan SO_2		Max 4.0	2.16
2. Pengujian Fisika:			
Kehalusan:			
- Dengan Alat Blaine	(M^2/kg)	Min 280	365
- Sisa di atas ayakan 0,045 mm	(%)	-	9.0
Waktu pengikatan (Vicat Test):		90 min	45 min
- Awal	(menit)	1440 max	375 max
- Akhir	(menit)		
Pemuaian di Autoclave			
- Awal	(%)	-	-
- Akhir	(%)		
Kuat tekanan			
- 3 hari	Kg/cm^2	Min 125	185
- 7 hari	Kg/cm^2	Min 200	263
- 28 hari	Kg/cm^2	Min 250	410
Contens Mortar air	(%)	Max 12	2.75

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Semen Padang, Portland Pozzolan Cement (PPC)

Keterangan		Hasil Uji	Persyaratan			
			SNI 15-0302-94		ASTM C 595 M-95a	
			IP.u	IP.k	IP	IP(MS)
I. Komposisi Kimia:						
Magnesium Oksida (MgO)	%	0.62	6.0 max	6.0 max	6.0 max	6.0 max
SO_3	%	1.32	4.0 max	4.0 max	4.0 max	4.0 max
Hilang Pijar	%	2.54	5.0 max	5.0 max	5.0 max	5.0 max
II. Pengujian Fisika:						
Kehalusan:						
Sieve residue on 90u	%	1.65	10 max	10 max	-	-
Air permeability (Blaine)	Cm^2/mg	3458	2800 min		-	-
Pemuaian Autoclave expansion	%	0.09	0.8 max	0.8 max	0.8 max	0.8 max
Autoclave compaction	%	-	0.2 max	0.2 max	0.2 max	0.2 max
Time of setting (Vicat test):						
- Awal	Menit	105	45 min	45 min	45 min	45 min
- Akhir	Jam	3:55'	7 max	7 max	7 max	7 max
Air content of Mortar	% vol	-	12 max	12 max	12 max	12 max
Compressive Strength:						
- 3 hari	Kg/cm^2	164	133 min	106 min	133 min	112 min
- 7 hari	Kg/cm^2	235	205 min	164 min	204 min	184 min
- 28 hari	Kg/cm^2	320	320 min	205 min	255 min	255 min
Hidrasi panas:						
- 7 hari	Cal/g	67.63	-	70 max	70 max	70 max
- 28 hari	Cal/g	76.80	-	80 max	80 max	80 max

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Semen Tonasa, Portland Pozzolan Cement (PPC)

HASIL PENGUJIAN		SNI 15-0302-2004	Hasil Uji PPC
1.Komposisi Kimia:			
Kandungan S_3O	(%)	Max 4.0	2.15
MgO	(%)	Max 6.0	0.97
Hilang pijar	(%)	Max 5.0	1.98
2. Pengujian Fisika			
Kehalusan			
- dengan alat Blaine	(m^2/kg)	Min 280	360
- Retained on sieve 0,045 mm	(%)	-	9.6
Waktu pengukuran, Vicat Test			
- Awal	(menit)	Min 45	100
- Akhir	(jam)	Max 7	4.25
Pemuaian di Autoclave			
- Expansion	(%)	Max 0.8	-
- Contraction	(%)	Max 0.2	0.04
Kuat Tekan			
- 3 hari	(kg/cm^2)		175
- 7 hari	(kg/cm^2)		240
- 28 hari	(kg/cm^2)		320
Hidrasi panas			
- 7 hari		-	65.00
- 28 hari		-	72.21
Content Mortar Air	(%)	Max 12	5.25

PT SEMEN GRESIK (PERSERO) Tbk.

PT SEMEN GRESIK (PERSERO) Tbk.
Jl. Veteran, Gresik 61122
Indonesia

Telp. (62-31) 3981731-2
Faks. (62-31) 3983209, 3972264
Bebas pulsa: 0800 10 88888

email: ptsg@sggrp.com
www.semengresik.com

Semen Tonasa, Portland Cement Type I

TIPE PENGUJIAN		SNI 15-2049-2004	ASTM C-150-2004	Hasil Pengujian
1.Komposisi Kimia:				
Silicon dioksida (SiO)	%	-	-	21.30
Aluminum oksida (AlO)	%	-	-	5.41
Ferric oksida (FeO)	%	-	-	3.53
Calcium oksida (CaO)	%	-	-	65.29
Magnesium oksida (MgO)	%	< 5.00	< 6.00	0.89
Sulphur Trioksida (SO)	%	< 3.50	< 3.50	2.25
Hilang Pijar	%	< 5.00	< 3.00	1.02
Kapur bebas	%	-	-	1.20
Bagian tidak larut	%	< 3.00	< 0.75	0.21
Alkai (Na 20+ 0,658 K20)	%	< 0.60	< 0.60	0.20
Tricalsium Silicate	(C_3S)	-	-	51.22
Dicalsium Silicate	(C_2S)	-	-	22.43
Tricalsium Aluminate	(C_3A)	-	-	8.36
Tetracalsium Aluminate Ferrit	(C_4AF)	-	-	10.74
2. Pengujian Fisika				
Kehalusan				
- dengan alat Blaine	(M^2/kg)	280	280	320
Waktu pengukuran (Vicat test)				
- Awal	(minutes)	> 45	> 45	100
- Akhir	(minutes)	< 375	< 375	240
Pemuaian di Autoclave				
- Pemuaian	%	< 0.80	< 0.80	0.04
Kuat tekan				
- 3 hari	(kg/cm^2)	> 125	> 122	210
- 7 hari	(kg/cm^2)	> 200	> 194	305
- 28 hari	(kg/cm^2)	-	-	390
False set				
- Penetrasi Akhir	%	> 50	> 50	70

Cables Construction

CABLE CONSTRUCTION

Medium voltage "SUPREME" cables are designed based on IEC 60502-2, SPLN 43-5 or others international standards upon request.

- **CONDUCTOR**
  The conductor made from annealed copper wire, circular stranded com pacted or round segmental compacted according to IEC 60228, BS 6360, AS 1125 or SPLN41-1.

- **CONDUCTOR SCREEN**
  The conductor screen made from extruded semi conductive compound.

- **INSULATION**
  The conductor screen are covered with an extruded layer of XLPE compound according to IEC 60502, AS 1429-1, BS 5464 or SPLN 41-9.

- **INSULATION SCREEN**
  The insulation screen made from extruded semiconductive compound in combination with the metallic screen. The metallic screen consist of a layer of either copper tape or copper wires with copper tape binder.

Conductor screen, insulaton and insulation screen are produced by triple extrusion with N_2 gas drying curing.

- **BEDDING/FILLER**
  The bedding and/or filler made from an layer of exruded PVC or non-hygroscopic material which compatible with the insulation and operating temperature of the cable.

- **METALLIC SHEATH**
  The metallic sheath made from lead alloy material with kinds of grade such as 1/2 C, E grade. The main function of lead sheath is to protect the cable from physical deterioration caused by chemical liquid such as sulfides , waste oil and to provide an impermeable water barrier.

- **INNER SHEATH**
  The inner sheath made from a layer of extruded PVC ST2 type to IEC 60502-2 or YM/2 type to SPLN 41-2 , type 9 to BS 7655 or other international standards.

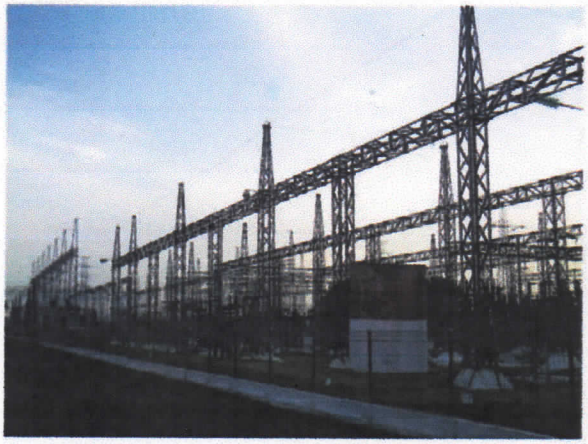
- **ARMOURING**
  The armouring made from either welded continuously aluminium corrugated, galvanized round steel wire, galvanized steel tape, round aluminium wire or aluminium tape.

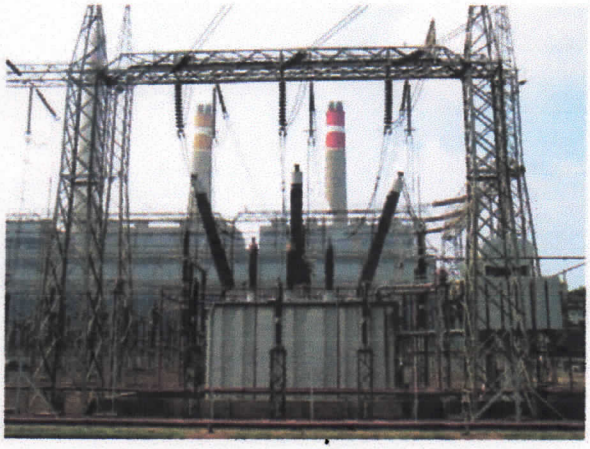
- **OUTER SHEATH**
  The outer sheath made from a layer of extruded Polyethylene or PVC ST2 type to IEC 60502-2 or YM/2 type to SPLN 41-2 , type 9 to BS 7655 or other internasional standards.

ROUTINE FINAL INSPECTION

Routine final inspection will be done for every length of product, such as :

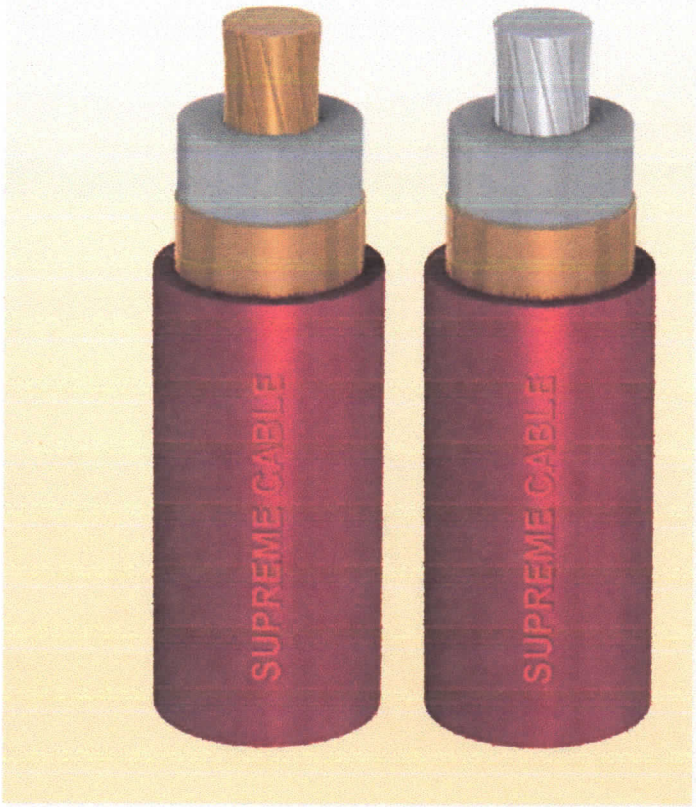
- **Visual**
- **Dimension**
- **Conductor resistance**
- **AC voltage test**

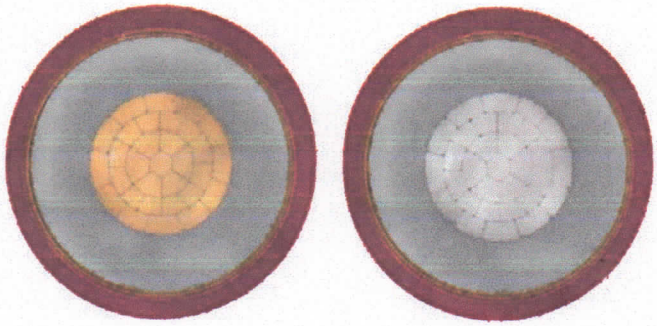




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CABLE TYPE	VOLTAGE (kV)	STANDARD	PAGE
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N2XSY/NA2XSY	1.8/3(3.6) 3.6/6(7.2) 6/10(12) 8.7/15(17.5) 12/20(24) 18/30(36)	IEC 60502-1 IEC 60502-2/SPLN 43-5	1 2 3 4 5 6
N2XSRY/NA2XSRY	1.8/3(3.6) 3.6/6(7.2) 6/10(12) 8.7/15(17.5) 12/20(24) 18/30(36)	IEC 60502-1 IEC 60502-2	7 8 9 10 11 12
N2XKY/NA2XKY N2XSKY/NA2XSKY	1.8/3(3.6) 3.6/6(7.2) 6/10(12) 8.7/15(17.5) 12/20(24) 18/30(36)	IEC 60502-1 IEC 60502-2	13 14 15 16 17 18
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NFA2XSY-T	12/20(24)	IEC 60502-2/SPLN 43-5	50
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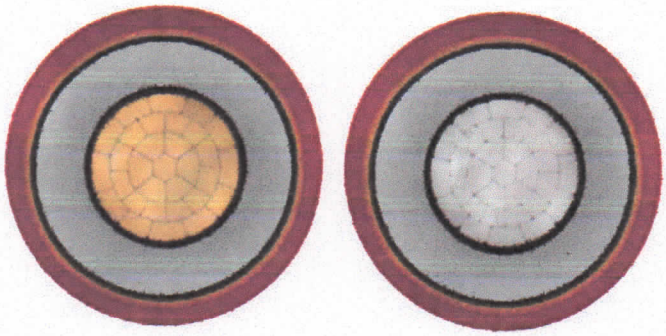
N2XSY/NA2XSY
1.8/3(3.6) kV
IEC 60502-1

**Copper/Aluminium conductor,
XLPE insulated,
Copper wire/ tape screened,
PVC sheathed cable**

DIMENSIONAL AND ELECTRICAL DATA — **1 CORE**

Nominal cross-sectional area			mm²	25	35	50	70	95	120	150	185	240	300	400	500	630	800
Conductor diameter (approx)			mm	6.05	7.1	8.25	9.9	11.7	13.1	14.3	16.3	18.2	20.9	23.7	26.6	30.3	34.2
Nominal insulation thickness			mm	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.6
Insulation diameter (approx)			mm	10.3	11.3	12.5	14.1	15.9	17.3	18.5	20.5	22.9	25.1	27.9	31.2	35.3	39.6
Nominal outer sheath thickness			mm	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.7	1.8	1.8	1.9	2.0	2.2	2.3
Overall cable diameter (approx)			mm	13	14	15	17	19	21	22	24	27	29	32	35	39	44
Cable net weight (approx)		CU	Kg/Km	400	500	600	800	1,100	1,300	1,600	2,000	2,500	3,100	3,900	5,000	6,400	8,200
		AL		200	250	300	400	500	600	700	800	1,000	1,200	1,500	1,900	2,400	3,100
Standard length per-reel			m	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	500	500	500	500
Minimum bending radius			mm	190	210	240	270	310	340	360	400	450	500	560	620	700	780
Max. DC conductor resistance at 20 °C		CU	Ω/Km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221
		AL		1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367
Min. insulation resistance at 20 °C			MΩ.Km	900	700	700	600	500	400	400	400	300	300	300	300	200	200
Capacitance per phase			μF/Km	0.261	0.299	0.334	0.393	0.453	0.499	0.539	0.606	0.685	0.758	0.851	0.871	0.909	0.947
Inductance per phase	o		mH/Km	0.345	0.327	0.313	0.3	0.287	0.280	0.274	0.267	0.260	0.253	0.248	0.245	0.243	0.239
	o o			0.529	0.512	0.498	0.485	0.471	0.465	0.459	0.452	0.445	0.438	0.433	0.430	0.428	0.424
	o o o																
Max.short circuit current of conductor		CU	kA/sec	3.73	5.18	7.36	10.26	13.88	17.49	21.81	26.86	34.78	43.41	57.79	72.16	90.83	115.23
		AL		2.49	3.45	4.89	6.81	9.19	11.58	14.43	17.76	22.98	28.67	38.14	47.60	59.90	75.96
Maximum current carrying capacity at 30 °C	in air	o	CU	162	195	234	292	354	407	461	528	622	730	816	922	1,008	1,120
		o o	AL	125	151	181	217	275	317	360	413	490	560	652	745	805	895
		o o o	CU	191	231	277	345	418	481	538	613	717	812	902	1,007	1,089	1,210
			AL	147	178	215	268	327	377	425	486	574	653	742	839	871	968
	in ground	o	CU	151	180	211	258	308	349	390	440	508	570	639	719	781	832
		o o	AL	116	138	164	201	239	272	304	345	400	451	512	575	624	665
		o o o	CU	172	204	239	291	344	388	424	474	541	602	650	775	820	873
			AL	132	157	186	227	270	305	337	378	435	488	538	616	656	698
AC test voltage			kV/5 min	6.5													





N2XSY/NA2XSY
3.6/6(7.2) kV
SPLN 43-5/IEC 60502-2

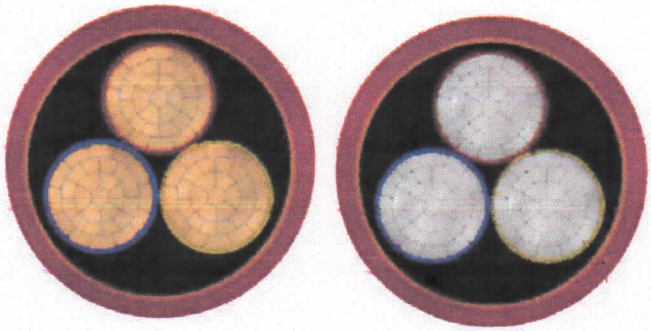
**Copper/Aluminium conductor,
XLPE insulated,
with or without water sealing,
Copper wire/ tape screened,
PVC sheathed cable**

DIMENSIONAL AND ELECTRICAL DATA

1 CORE

Nominal cross-sectional area			mm²	25	35	50	70	95	120	150	185	240	300	400	500	630	800
Conductor diameter (approx)			mm	6.05	7.1	8.25	9.9	11.7	13.1	14.3	16.3	18.2	20.9	23.7	26.6	30.3	34.2
Nominal insulation thickness			mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0	3.2	3.2	3.2
Insulation diameter (approx)			mm	12.5	13.5	14.7	16.3	18.1	19.5	20.7	22.7	24.8	27.9	31.9	36.0	39.7	43.2
Nominal outer sheath thickness			mm	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	2.1	2.2	2.3	2.5
Overall cable diameter (approx)			mm	18.9	19.9	21.1	22.7	24.3	25.7	27.1	29.1	31.4	34.6	38.9	44.0	47.9	52.7
Cable net weight (approx)		CU	Kg/Km	656	779	929	1,175	1,440	1,711	2,049	2,454	3,078	3,775	4,737	6,046	7,564	9,242
		AL		490	548	620	725	813	922	1,074	1,239	1,477	1,767	2,168	2,770	3,316	3,921
Standard length per-reel			m	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	500	500	500	500
Minimum bending radius			mm	240	270	290	320	360	390	410	460	510	560	620	680	780	860
Max. DC conductor resistance at 20 °C		CU	Ω/Km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221
		AL		1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367
Min. insulation resistance at 20 °C			MΩ.Km	900	800	700	600	500	500	500	400	400	400	400	300	300	300
Capacitance per phase			μF/Km	0.191	0.216	0.240	0.279	0.318	0.349	0.376	0.419	0.459	0.481	0.511	0.540	0.534	0.595
Inductance per phase		o	mH/Km	0.409	0.391	0.372	0.353	0.333	0.323	0.316	0.306	0.295	0.289	0.283	0.278	0.279	0.272
		o o															
		o o o		0.594	0.575	0.556	0.538	0.518	0.508	0.501	0.491	0.480	0.474	0.468	0.463	0.464	0.457
Max.short circuit current of conductor		CU	kA/sec	3.73	5.18	7.36	10.26	13.88	17.49	21.81	26.86	34.78	43.41	57.79	72.16	90.83	115.23
		AL		2.49	3.45	4.89	6.81	9.19	11.58	14.43	17.76	22.98	28.67	38.14	47.60	59.90	75.96
Max.short circuit current of screen				2.26	2.43	2.63	2.90	2.56	2.75	3.63	3.96	4.39	4.82	5.35	5.90	6.34	6.99
Maximum current carrying capacity at 30 °C	in air	o	CU	161	194	233	291	353	406	459	526	620	728	814	920	1,006	1,118
		o o	AL	124	150	180	213	274	316	358	411	488	558	650	743	803	893
		o o o	CU	190	230	276	344	417	480	536	611	715	810	900	1,005	1,087	1,209
			AL	146	177	214	267	326	376	423	484	572	651	740	837	870	967
	in ground	o	CU	150	179	210	257	307	348	388	438	506	568	637	717	779	831
		o o	AL	115	137	163	200	238	271	302	343	398	449	510	574	622	663
		o o o	CU	171	203	238	290	343	387	422	472	539	601	648	774	818	871
			AL	131	156	185	226	269	304	335	376	434	486	536	614	654	697
AC test voltage			kV/5 min	12.5 (IEC) , 9 (SPLN)													





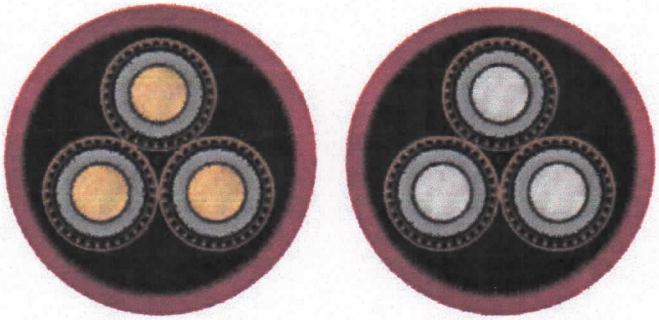
N2XSY/NA2XSY
1.8/3(3.6) kV
IEC 60502-1

Copper/Aluminium conductor, XLPE insulated, Copper wire/tape screened, PVC sheathed cable

DIMENSIONAL AND ELECTRICAL DATA — **3 CORES**

Nominal cross-sectional area		mm²	25	35	50	70	95	120	150	185	240	300	400
Conductor diameter (approx)		mm	6.05	7.1	8.25	9.9	11.7	13.1	14.3	16.3	18.2	20.9	23.7
Nominal insulation thickness		mm	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Insulation diameter (approx)		mm	10.3	11.3	12.5	14.1	15.9	17.3	18.5	20.5	22.9	25.1	27.9
Nominal outer sheath thickness		mm	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.7	2.8	3.1
Overall cable diameter (approx)		mm	28	30	33	37	41	44	47	51	57	62	69
Cable net weight (approx)	CU	Kg/Km	1400	1800	2,200	3,000	3,900	4,800	5,700	7,000	8,900	11,000	14,000
	AL		950	1100	1,400	1,700	2,100	2,500	2,900	3,500	4,300	5,300	6,500
Standard length per-reel		m	500	500	500	500	500	500	500	500	500	500	500
Minimum bending radius		mm	260	280	310	350	400	430	460	510	570	620	700
Max. DC conductor resistance at 20 °C	CU	Ω/Km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
	AL		1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
Min. insulation resistance at 20 °C		MΩ.Km	900	700	700	600	500	400	400	400	300	300	300
Capacitance per phase		µF/Km	0.261	0.299	0.334	0.393	0.453	0.499	0.539	0.606	0.685	0.758	0.851
Inductance per phase		mH/km	0.295	0.282	0.272	0.259	0.250	0.244	0.240	0.234	0.229	0.225	0.221
Max.short circuit current of conductor	CU	kA/sec	3.73	5.18	7.36	10.26	13.88	17.49	21.81	26.86	34.78	43.41	57.79
	AL		2.49	3.45	4.89	6.81	9.19	11.58	14.43	17.76	22.98	28.67	38.14
Maximum current carrying capacity at 30 °C — in air	CU	A	134	175	207	258	315	362	413	473	557	663	765
	AL		103	133	160	200	241	280	317	363	424	484	597
in ground	CU		133	172	203	247	297	337	379	428	497	557	629
	AL		102	131	156	192	230	261	294	333	388	416	498
AC test voltage		kV/5 min						6.5					





N2XSEY/NA2XSEY

3.6/6(7.2) kV

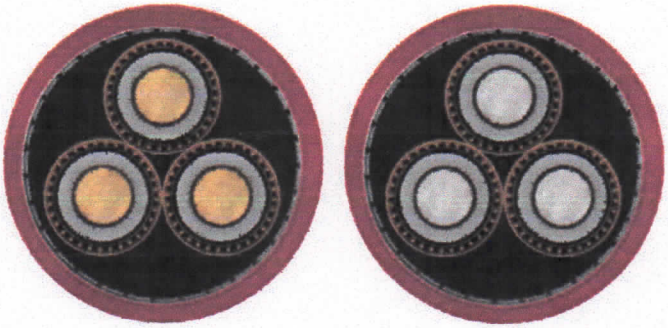
SPLN 43-5/IEC 60502-2

**Copper/Aluminium conductor,
XLPE insulated,
with or without water sealing,
Copper wire/tape screened,
PVC sheathed cable**

DIMENSIONAL AND ELECTRICAL DATA — **3 CORES**

Nominal cross-sectional area		mm^2	25	35	50	70	95	120	150	185	240	300	400
Conductor diameter (approx)		mm	6.05	7.1	8.25	9.9	11.7	13.1	14.3	16.3	18.2	20.9	23.7
Nominal insulation thickness		mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0
Insulation diameter (approx)		mm	12.5	13.5	14.7	16.3	18.1	19.5	20.7	22.7	24.8	27.9	31.9
Nominal outer sheath thickness		mm	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.1
Overall cable diameter (approx)		mm	37	39	42	46	50	53	56	60	66	72	80
Cable net weight (approx)	CU	Kg/Km	2,100	2,500	3,000	3,800	4,800	5,800	6,700	8,100	10,200	12,500	15,600
	AL		1,600	1,800	2,100	2,500	3,000	3,500	3,900	4,600	5,600	6,700	8,200
Standard length per-reel		m	500	500	500	500	500	500	500	500	500	500	350
Minimum bending radius		mm	320	350	380	420	460	500	530	570	640	700	780
Max. DC conductor resistance at 20 °C	CU	Ω/Km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
	AL		1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
Min. insulation resistance at 20 °C		MΩ.Km	900	800	700	600	500	500	500	400	400	400	400
Capacitance per phase		μF/Km	0.191	0.216	0.240	0.279	0.318	0.349	0.376	0.419	0.459	0.481	0.511
Inductance per phase		mH/km	0.322	0.308	0.298	0.284	0.273	0.266	0.261	0.254	0.249	0.246	0.243
Max.short circuit current of conductor	CU	kA/sec	3.73	5.18	7.36	10.26	13.88	17.49	21.81	26.86	34.78	43.41	57.79
	AL		2.49	3.45	4.89	6.81	9.19	11.58	14.43	17.76	22.98	28.67	38.14
Max.short circuit current of screen			1.90	2.05	2.21	2.44	2.69	2.89	3.05	3.33	3.70	4.06	4.51
Maximum current carrying capacity at 30 °C — in air	CU	A	134	175	207	258	315	362	413	473	557	663	765
	AL		103	133	160	200	241	280	317	363	474	484	597
in ground	CU		133	172	203	247	297	357	379	428	497	557	628
	AL		102	131	156	192	230	261	294	333	388	416	498
AC test voltage		kV/5 min	12.5 (IEC) , 9 (SPLN)										





N2XSEFGbY/ NA2XSEYFGbY

3.6/6(7.2) kV

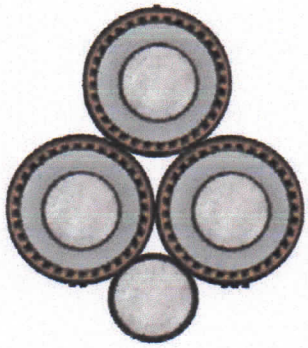
SPLN 43-5/IEC 60502-2

Copper/Aluminium conductor, XLPE insulated, with or without water sealing, Copper wire/tape screened, Galvanized flat steel wire armoured, PVC sheathed cable

DIMENSIONAL AND ELECTRICAL DATA — **3 CORES**

Nominal cross-sectional area		mm²	25	35	50	70	95	120	150	185	240	300	400
Conductor diameter (approx)		mm	6.05	7.1	8.25	9.9	11.7	13.1	14.3	16.3	18.2	20.9	23.7
Nominal insulation thickness		mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0
Insulation diameter (approx)		mm	12.5	13.5	14.7	16.3	18.1	19.5	20.7	22.7	24.8	27.9	31.9
Nominal flat wire armour thickness		mm	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Nominal outer sheath thickness		mm	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.1	3.3	3.6
Overall cable diameter (approx)		mm	40	42	45	49	53	56	59	64	70	76	84
Cable net weight (approx)	CU	Kg/Km	2900	3300	3,900	4,900	6,000	7,000	8,100	9,600	11,900	14,300	17,700
	AL		2400	2700	3,000	3,600	4,200	4,700	5,200	6,100	72,000	8,600	10,300
Standard length per-reel		m	500	500	500	500	500	500	500	500	350	350	350
Minimum bending radius		mm	350	370	400	440	490	520	550	600	670	730	810
Max. DC conductor resistance at 20 °C	CU	Ω/Km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
	AL		1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
Min. insulation resistance at 20 °C		MΩ.Km	900	800	700	600	500	500	500	400	400	400	400
Capacitance per phase		μF/Km	0.191	0.216	0.240	0.279	0.318	0.349	0.376	0.419	0.459	0.481	0.511
Inductance per phase		mH/km	0.358	0.339	0.325	0.307	0.293	0.284	0.277	0.268	0.261	0.258	0.253
Max.short circuit current of conductor	CU	kA/sec	3.73	5.18	7.36	10.26	13.88	17.49	21.81	26.86	34.78	43.41	57.79
	AL		2.49	3.45	4.89	6.81	9.19	11.58	14.43	17.76	22.98	28.67	38.14
Max.short circuit current of screen			1.90	2.05	2.21	2.44	2.69	2.89	3.05	3.33	3.70	4.06	4.51
Maximum current carrying capacity at 30 °C — in air	CU	A	133	172	205	256	312	359	409	468	552	627	758
	AL		102	132	159	198	239	277	314	360	420	479	591
in ground	CU		132	170	201	245	294	334	375	424	492	552	623
	AL		101	130	155	190	228	259	291	330	384	412	493
AC test voltage		kV/5 min	12.5 (IEC) , 9 (SPLN)										





NFA2XSY-T
12/20(24) kV
SPLN 43-5/IEC 60502-2
Aerial twisted cable

**Aluminium conductor, XLPE insulated,
Copper/wire tape screened,
PVC sheathed with stranded galvanized
round steel wire insulated messenger**

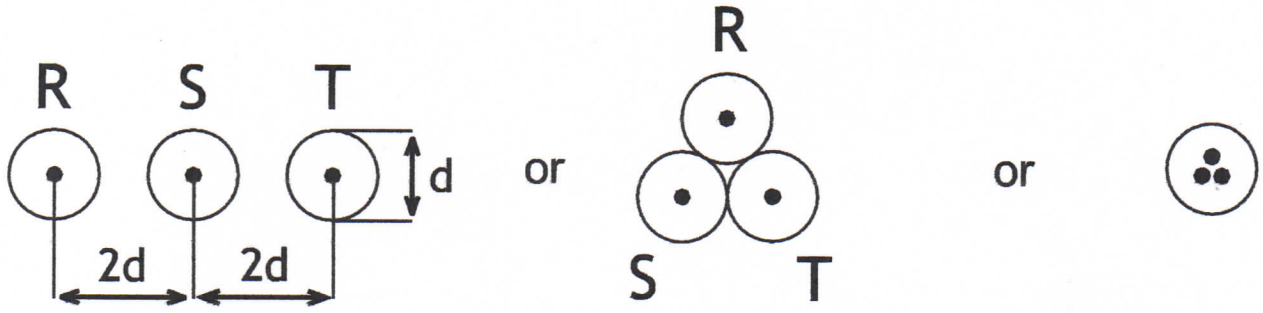
DIMENSIONAL AND ELECTRICAL DATA

Nominal cross-sectional area	mm^2	3x35+50	3x50+50	3x70+50	3x95+50	3x120+50	3x150+50	3x185+50	3x240+50	3x300+50
Conductor diameter (approx)	mm	7.0	8.2	9.8	11.5	12.9	14.1	16.1	18.0	20.6
Nominal insulation thickness	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Insulation diameter (approx)	mm	19.6	20.8	22.4	24.1	25.5	26.7	28.7	30.8	33.2
Nominal outer sheath thickness	mm	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2
Overall cable diameter (approx)	mm	56	58	62	66	70	73	77	83	88
Cable net weight (approx)	Kg/Km	2800	3,100	3,500	3,900	4,300	4,800	5,200	6,000	6,800
Standard length per-reel	m	500	500	500	500	350	350	350	350	350
Minimum bending radius	mm	470	500	540	580	620	650	700	760	820
Max. DC conductor resistance at 20 °C	Ω/Km	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100
Min. insulation resistance at 20 °C	MΩ.Km	1400	1,300	1,100	1,000	900	900	800	700	700
Capacitance per phase	µF/Km	0.106	0.116	0.128	0.141	0.152	0.160	0.175	0.189	0.206
Inductance per phase	mH/km	0.418	0.400	0.382	0.365	0.354	0.346	0.333	0.323	0.312
Max.short circuit current of conductor	kA/sec	3.45	4.89	6.81	9.19	11.58	14.43	17.76	22.98	28.67
Max.short circuit current of screen		2.77	2.92	3.14	3.38	3.57	4.66	3.99	4.31	4.6
Maximum current carrying capacity at 30 °C in AIR	A	142	165	204	247	287	326	373	435	481
AC test voltage	kV/5 min	42 (IEC) , 30 (SPLN)								

Conditions for current carrying capacity

The tabulated current ratings are designed by the conditions as below :

- One circuit of three phase load.



- Load factor = 1.0
- Maximum operating conductor temperature :

  70° C (PVC insulation) and 90° C (XLPE insulation)
  No other heat sources installed near the group of cables.
- Cable laying :

in air : - Ambient temperature : 30°C

- The cable have to protected against heat radiation of the sun as well as sufficiently large and ventilated rooms whose temperature is not perceptibly increased by the heat dissipating from the loaded cable.

in ground :

- Soil temperature : 30°C
- Depth of laying : 70 cm
- Specific thermal resistivity of soil : 100° C.m/watt

NOTE :

If the actual installed conditions are different from the above mentioned condition, the tabulated current ratings should be multiplied by the appropriate derating factors as shown in tables on the next pages.

DERATING FACTORS

A. Grouping in the ground.

1 Variation in ground temperature.

	Ground temperatures (°C)						
	20	25	30	35	40	45	50
XLPE insulation	1.08	1.04	1.00	0.96	0.91	0.87	0.82
PVC insulation	1.12	1.07	1.00	0.94	0.87	0.79	0.71

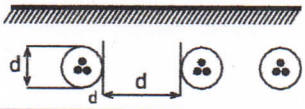
2 Variation in thermal resistivity of soil.

	Thermal resistivity of soil (°C.cm/watt)			
	70	100	150	250
XLPE insulation	1.12	1.0	0.87	0.78
PVC insulation	1.11	1.0	0.82	0.70

3 Variation in depth of laying.

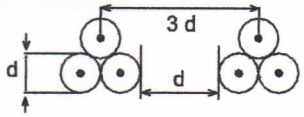
	Depth of laying (cm)					
	50	70	100	120	160	200
XLPE insulation	1.02	1.00	0.98	0.97	0.95	0.94
PVC insulation	1.01	1.00	0.99	0.98	0.97	0.96

4 GROUPING of multicore cables.



	Number Of grouping							
	1	2	3	4	5	6	8	10
XLPE insulation	1.00	0.86	0.76	0.71	0.67	0.64	0.60	0.57
PVC insulation	1.00	0.85	0.75	0.68	0.64	0.60	0.56	0.53

5 GROUPING of single core cables (Trefoil formation)



	Number Of grouping							
	1	2	3	4	5	6	8	10
XLPE insulation	1.00	0.89	0.82	0.78	0.75	0.73	0.70	0.68
PVC insulation	1.00	0.90	0.82	0.79	0.76	0.74	0.71	0.69

6 GROUPING of single core cables (Flat formation)



	Number Of grouping							
	1	2	3	4	5	6	8	10
XLPE insulation	1.00	0.87	0.77	0.73	0.70	0.68	0.65	0.63
PVC insulation	1.00	0.87	0.78	0.74	0.70	0.68	0.65	0.63

CONVERSION TABLE

Nominal cross sectional area			Wire gauge			
mm^2	Inc^2	Circular Mils (CM)	Equivalent Metric CSA	AWG	BWG	SWG
	0.0005	644	0.325	22	-	-
	0.0006	487	0.397	-	22	22
	0.0006	821	0.416	21	-	-
0.50	0.0008	987	-	-	-	-
	0.0008	1,021	0.517	20	-	-
	0.0008	1,025	0.519	-	21	21
	0.0009	1,198	0.607	-	20	-
	0.0010	1,289	0.653	19	-	-
	0.0010	1,297	0.657	-	-	20
	0.0013	1,601	0.811	-	-	19
0.75	0.0012	1,481	-	-	-	-
	0.0013	1,625	0.823	18	-	-
	0.0014	1,765	0.894	-	19	-
1.0	0.0016	1,974	-	-	-	-
	0.0016	2,053	1.040	17	-	-
	0.0016	2,304	1.167	-	-	18
	0.0019	2,402	1.217	-	18	-
	0.0020	2,584	1.309	16	-	-
1.5	0.0023	2,961	-	-	-	-
	0.0025	3,137	1.589	-	-	17
	0.0026	3,257	1.650	15	-	-
	0.0026	3,366	1.705	-	17	-
	0.0032	4,096	2.075	-	-	16
	0.0032	4,108	2.081	14	-	-
	0.0033	4,226	2.141	-	16	-
2.5	0.0039	4,935	-	-	-	-
	0.0040	5,180	2.624	13	-	-
	0.0040	5,186	2.627	-	15	15
	0.0050	6,402	3.243	-	-	14
	0.0051	6,532	3.309	12	-	-
	0.0054	6,891	3.491	-	14	-
4	0.0062	7,896	-	-	-	-
	0.0065	8,236	4.172	11	-	-
	0.0066	8,466	4.269	-	-	13
	0.0071	9,072	4.573	-	13	-
	0.0082	10,387	5.262	10	-	-
	0.0085	10,819	5.481	-	-	12
	0.0093	11,883	6.020	-	12	-
6	0.0093	11,844	-	-	-	-
	0.0103	13,092	6.632	9	-	-
	0.0106	13,459	6.816	-	-	11
	0.0113	14,404	7.297	-	11	-
	0.0129	16,388	8.302	-	-	10
	0.0130	16,518	8.368	8	-	-
	0.0141	17,959	9.098	-	10	-
10	0.0155	19,740	-	-	-	-
	0.0163	20,766	10.520	-	-	9
	0.0164	20,826	10.550	7	-	-
	0.0172	21,911	11.100	-	9	-
	0.0201	25,603	12.970	-	-	8
	0.0206	26,254	13.300	6	-	-
	0.0214	27,241	13.800	-	8	-
	0.0243	30,992	15.700	-	-	7
16	0.0248	31,584	-	-	-	-
	0.0255	32,413	16.420	-	7	-

Nominal cross sectional area			Wire gauge			
mm^2	Inc^2	Circular Mils (CM)	Equivalent Metric CSA	AWG	BWG	SWG
	0.0290	36,874	18.68	-	-	6
	0.0324	41,217	20.88	-	6	-
	0.0326	41,750	21.15	4	-	-
	0.0353	44,948	22.77	-	-	5
	0.0380	48,402	24.52	-	5	-
25	0.0388	49,350	-	-	-	-
	0.0413	52,627	26.66	3	-	-
	0.0423	53,831	27.27	-	-	4
	0.0445	56,654	28.70	-	4	-
	0.0499	63,523	32.18	-	-	3
	0.0521	66,386	33.63	2	-	-
	0.0527	67,096	33.99	-	3	-
35	0.0543	69,090	-	-	-	-
	0.0598	76,196	28.60	-	-	2
	0.0633	80,677	40.87	-	2	-
	0.0657	83,717	42.41	1	-	-
	0.0707	90,014	45.60	-	1	1
50	0.0775	98,700	-	-	-	-
	0.0824	404,997	53.19	-	-	1/0
	0.0829	105,589	53.49	1/0	-	-
	0.0908	115,637	58.58	-	1/0	-
	0.0951	121,125	61.36	-	-	2/0
	0.1045	133,087	67.42	2/0	-	-
70	0.1085	138,180	-	-	-	-
	0.1087	138,417	70.12	-	-	3/0
	0.1134	144,438	73.17	-	2/0	-
	0.1257	160,032	81.07	-	-	4/0
	0.1318	167,849	85.03	3/0	-	-
	0.1419	180,660	91.52	-	3/0	-
	0.1466	186,661	94.56	-	-	5/0
95	0.1473	187,530	-	-	-	-
	0.1616	206,086	104.40	-	4/0	-
	0.1691	211,613	107.20	4/0	-	-
	0.1860	215,363	109.10	-	-	6/0
120	0.1860	236,880	-	-	-	-
	0.1963	249,987	126.64	-	-	-
	0.1964	250,106	126.70	-	5/0	7/0
	0.2091	266,332	134.92	5/0	-	-
150	0.2325	296,100	-	-	-	-
	0.2356	300,048	152.00	-	-	-
	0.2642	336,488	170.46	6/0	-	-
185	0.2868	365,190	-	-	-	-
	0.3142	400,150	202.71	-	-	-
240	0.3720	473,760	-	-	-	-
	0.3927	500,113	253.35	-	-	-
300	0.4650	592,200	-	-	-	-
	0.4712	600,096	304.00	-	-	-
	0.5498	700,198	354.71	-	-	-
400	0.6200	789,600	-	-	-	-
	0.6283	800,161	405.35	-	-	-
500	0.7750	987,000		-	-	-
	0.7854	1,000,246	506.71	-	-	-
625	0.9688	1,233,750	-	-	-	-
630	0.9765	1,243,620	-	-	-	-
800	1.2400	1,597,200	-	-	-	-

TOTO



SANITARY CATALOG

APRIL 2018

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NEOREST SUITE

20 years ago, TOTO introduced NEOREST,
A revolutionary masterpiece that defines the modern luxury bathroom. It combines the advanced features found in the WASHLET along with more groundbreaking upgrades while adhering to the highest standards of design.





NEOREST LE I
CES 994 WA

4.5/3 L Automatic Dual Flush

Rough-In: 220 mm (P-Trap)



NEOREST XH1
CES 992 WAV1

3.8/3 L Automatic Dual Flush
Color Trim: Gold

Bowl Shape: Elongated
Rough-In: 305 mm



NEOREST XH1
CES 992 WA

3.8/3 L Automatic Dual Flush

Bowl Shape: Elongated
Rough-In: 305 mm



NEOREST AH
CES 9786 WA

3.8/3 L Automatic Dual Flush

Bowl Shape: Elongated
Rough-In: 305 mm



NEOREST
LW 991 A

Lavatory with State of The Art
Hands Free Technology
Size: 750 x 500 x 230 mm



NEOREST
PJY 1886 HPWMNE

Free Standing Bathtub with Grip
Silver Braid Rim Design
Size: 1820 x 950 x 600 mm
Capacity: 310 liters

Pop-Up Waste: Included

Available:
PJY 1886 HPWMGE (Gold Rim)
Reinforced Marble Free
Standing Bathtub

JEWELHEX,
Transforms your environment into a distinctive, one-of-a-kind living space. The durable surface material has unique dimensions and angles that add a touch of creativity to your environment.

JEWELHEX SUITE





JEWELHEX
C 680 EID / S 680 DE

4.5/3 L Dual Flush
Soft Close Seat & Cover

Bowl Shape: Elongated
Rough-In: 305 mm
with S-Connector



JEWELHEX
CW 681 EID

Wall Faced

6/3 L Dual Flush
Soft Close Seat & Cover

Bowl Shape: Elongated
Rough-In: 220 mm
with S-Connector



JEWELHEX
CW 682 EID

Wall Hung

6/3 L Dual Flush
Seat & Cover

Bowl Shape: Elongated
Rough-In: 220 mm



JEWELHEX
L 681 E

Console Lavatory Body
Size: 607 x 483 x 211 mm



JEWELHEX
L 682 E

Self Rimming Lavatory Body
Size: 685 x 490 x 211 mm



JEWELHEX
PAY 1810 HPWE

Acrylic Bathtub with Hand Grips &
Pop-Up Waste
Size: 1800 x 850 x 580 mm
Capacity: 300 liters

Pop-Up Waste: Included

BASIC+ SUITE

BASIC+,
Wherever there is water, there is the surface tension that forms the subtle waves and smooth swells of streams, rivers and lakes. It is the property that has inspired the beautiful curvature of the Basic+ Series.





BASIC+
C 761 EID / S 760 DE

4.5/3 L Dual Flush
Seat & Cover

Bowl Shape: European Std.
Rough-In: 305 mm
with S-Connector



BASIC+
C 762 EID

Wall Hung

4.5/3 L Dual Flush
Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm



BASIC+
LW 760 LB

Console Lavatory Body
Size: 500 x 421 x 190 mm



BASIC+
L 763 E

Self Rimming Lavatory Body
Size: 530 x 450 x 177 mm



BASIC+
L 762 E

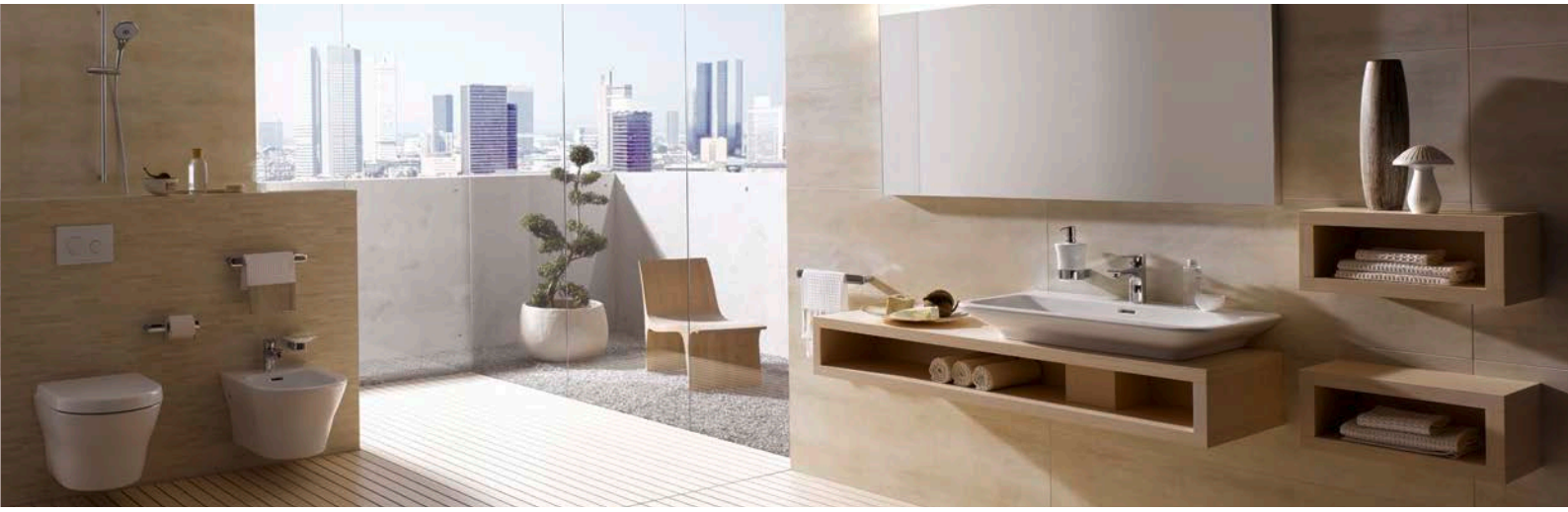
Self Rimming Lavatory Body
Size: 530 x 450 x 177 mm



BASIC+
L 765 E

Under Counter Lavatory Body
Size: 540 x 460 x 167 mm

MH SERIES,
Creativity requires space to spread its wings, which is why MODULAR HOME provides the flexibility essential in the cosmopolitan bathrooms of today. To ensure your bathroom meets your needs, all the collection's elements are modular in design, giving you the creative scope to design a bathroom that lives up to your expectations.







MH
CW 162 EHID

Wall Hung

With Concealed Hole
4.5/3 L Dual Flush
Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm





MH
CW 162 EID

Wall Hung

Without Concealed Hole
4.5/3 L Dual Flush
Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm





MH
CW 163 EID

Wall Faced

4.5/3 L Dual Flush
Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm

ONE PIECE TOILET



GG
C 971 EID

4.5/3 L Dual Flush
Washlet

Rough-In: 305 mm



C 636 CDEID

With Concealed Hole
4.5/3 L Dual Flush

Bowl Shape: Elongated
Rough-In: 220 mm
with S-Connector



C 636 DEID

Without Concealed Hole
4.5/3 L Dual Flush
Seat & Cover

Bowl Shape: Elongated
Rough-In: 220 mm
with S-Connector



TOJA
CW 950 PJ

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Rough-In: 305 mm (S-Trap)
with S-Connector



TOJA
CW 950 PJ

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Rough-In: 180 mm (P-Trap)



CW 825 J

J - MAX 6 L System
Tornado-II Siphonic Flush
Rapid Flushing
Solid Duroplast Seat & Cover

Min. Water Pressure: 0.85 kgf/cm^2
Bowl Shape: Elongated
Rough-In: 305 mm



AVANTE
CW 823 NJ

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 305 mm (S-Trap)



AVANTE
CW 823 PJ

6 L Tornado-II Siphonic Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 180 mm (P-Trap)



WENZAL
CW 934 J

4.8 L Single Flush
Siphon-Jet Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 305 mm



CW 840 J

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 305 mm



CW 914 J

G - MAX 6 L System
Siphon-Jet Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 305 mm



SUPERIOR
C 436 N

6 L Siphon-Vortex Flush

Min. Water Pressure: 0.70 kgf/cm^2
Bowl Shape: Elongated
Rough-In: 305 mm



OMNI$^+$
CW 895 J

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 305 mm



CW 630 J

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm (S-Trap)



CW 630 PJ

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)

CLOSE COUPLED TOILET



ALISEI
CW 273 PJ / SW 273 JP

NEW

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm (S-Trap)
with S-Connector



ALISEI
CW 273 PJ / SW 273 JP

NEW

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)



LE MUSE
CW 811 PJ / SW 811 JP

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm (S-Trap)
with S-Connector



LE MUSE
CW 811 PJ / SW 811 JP

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)



CW 826 J / SW 826 JP

6/3 L Tornado-II Siphonic
Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 305 mm



CW 960 J / SW 960 JP

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 305 mm



CW 635 PJ / SW 635 JP1

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm (S-Trap)
with S-Connector



CW 635 PJ / SW 635 JP1

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)



CW 635 PJ / SW 635 JP2

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm (S-Trap)
with S-Connector



CW 635 PJ / SW 635 JP2

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)



AVANTE
CW 821 J / SW 821 JP

6/3 L Tornado-II Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm (S-Trap)



AVANTE
CW 821 PJ / SW 821 JP

6/3 L Tornado-II Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)



CW 632 PJ / SW 632 JP

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm (S-Trap)
with S-Connector



CW 632 PJ / SW 632 JP

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)



OMNI+
CW 896 J / SW 896 JP

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 305 mm



CW 668 J / SW 668 J

6 L Single Flush

Bowl Shape: Elongated
Rough-In: 230 mm (S-Trap)

Available:
CW 668 J / SW 668 JP



CW 668 PJ / SW 668 J

6 L Single Flush

Bowl Shape: Elongated
Rough-In: 180 mm (P-Trap)



C 704 L / SW 784 JP

For The Disabled
6 L Siphonic Flush

Bowl Height: 441 mm
Rough-In: 305 mm

CLOSE COUPLED TOILET



CW 631 J / SW 631 JP

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm (S-Trap)



CW 631 PJ / SW 631 JP

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)



CW 600 J / SW 600 JP

4.5/3 L Dual Flush

Bowl Shape: Round
Rough-In: 220 mm



CW 638 J / SW 638 JP

NEW

4.5/3 L Dual Flush

Bowl Shape: Round
Rough-In: 220 mm



CW 421 J / SW 420 JP

4.5/3 L Dual Flush

Bowl Shape: Round
Rough-In: 500 mm



EURO
CW 660 NJ / SW 660 J

4.5/3 L Dual Flush

Bowl Shape: Round
Rough-In: 230 mm



EURO
CW 660 NPJ / SW 660 J

4.5/3 L Dual Flush

Bowl Shape: Round
Rough-In: 180 mm (P-Trap)



CW 637 J / SW 637 JP

4.5/3 L Dual Flush

Bowl Shape: Round
Rough-In: 220 mm



CW 702 J / SW 784 JP

6 L Siphonic Flush

Bowl Shape: Round
Rough-In: 305 mm



CE 9

6 L Single Flush

Min. Water Pressure: 0.70 kgf/cm²
Rough-In: 582 mm



CW 10 J

Squatting Toilet

CE 6

Squatting Toilet



CE 7

Squatting Toilet



SINGLE BOWL TOILET



ALISEI
CW 274 J

NEW

Wall Hung

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 210 mm



ALISEI
CW 275 PJ

NEW

Wall Faced

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm



LE MUSE
CW 812 J

Wall Hung

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 210 mm



LE MUSE
CW 813 PJ

Wall Faced

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm



TOJA
CW 951 J

Wall Hung

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 210 mm



CW 800 J

Wall Hung

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 210 mm (P-Trap)



CW 800 J

Wall Hung

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 210 mm (P-Trap)



AVANTE
CW 822 NJ

Wall Hung

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 220 mm



AVANTE
CW 824 NPJ

Wall Faced

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm



CW 620 NJ

Wall Hung

4.5/3 L Dual Flush
Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm



AVANTE
CW 822 NJ

Wall Hung

4.5 L Single Flush
Solid Duroplast Seat & Cover
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Bowl Shape: Elongated
Rough-In: 220 mm



AVANTE
CW 824 NPJ

Wall Faced

4.5 L Single Flush
Solid Duroplast Seat & Cover
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Bowl Shape: European Std.
Rough-In: 180 mm



CW 620 NJ

Wall Hung

4.5 L Single Flush
Seat & Cover
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Bowl Shape: European Std.
Rough-In: 220 mm



CW 705 ELNJ

For The Disabled
6 L Siphon Jet Flush
Inlet: Top

Min. Water Pressure: 0.70 kgf/cm²
Bowl Height: 445 mm
Bowl Shape: Elongated
Rough-In: 280 mm



CW 705 ENJ

6 L Siphon Jet Flush
Inlet: Top

Min. Water Pressure: 0.70 kgf/cm²
Bowl Shape: Elongated
Rough-In: 280 mm



C 51

6 L Single Flush
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Bowl Shape: Round
Rough-In: 572 mm



CW 425 J

Children Toilet
6 L Single Flush
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Bowl Height: 245 mm
Rough-In: 470 mm

WASHLET & ECOWASHER



TCF 4731 A

Washlet (Apricot)
220 Volt / 830 W



TCF 4732 A

Washlet (D-Shape)
220 Volt / 830 W



TCF 6531 Z

Washlet
(Elongated / Regular Adjustable)
511,3 W



TCF 6631 A

Washlet
(Elongated / Regular Adjustable)
511,3 W



TCW 1211 A

Eco-Washer
* Bidet Function



TCW 07 S

Eco-Washer



TCW 08 S

Eco-Washer
* Bidet Function



TCW 09 S

Duroplast Eco-Washer
* Bidet Function



TCW 10 S

Duroplast Eco-Washer
* Bidet Function



TCW 03 SL

Eco-Washer With Long Elbow
(Elongated)



TCW 03 S

Eco-Washer (Elongated)



TCW 04 SL

Eco-Washer With Long Elbow
(Elongated)
* Bidet Function



TCW 04 S

Eco-Washer (Elongated)
* Bidet Function



TCW 05 SL

Eco-Washer With Long Elbow
(Round)



TCW 05 S

Eco-Washer (Round)



TCW 06 SL

Eco-Washer With Long Elbow
(Round)
* Bidet Function



TCW 06 S

Eco-Washer (Round)
* Bidet Function

VESSEL COUNTER LAVATORY



ALISEI
LW 276 J

NEW

Size: 700 x 370 x 160 mm



ALISEI
LW 275 J

NEW

Size: 750 x 370 x 160 mm



ALISEI
LW 274 J

NEW

Size: 610 x 370 x 160 mm



LE MUSE
LW 818 J

Size: 650 x 370 x 150 mm



LE MUSE
LW 814 CJ

Size: 750 x 480 x 150 mm



LE MUSE
LW 813 CJ

Size: 600 x 480 x 150 mm



LE MUSE
LW 819 J

Size: 800 x 370 x 150 mm



LE MUSE
LW 816 J

Size: 1400 x 400 x 150 mm



TOJA
LW 953 J

Size: 705 x 355 x 100 mm



TOJA
LW 952 J

Size: 570 x 355 x 100 mm



TOJA
LW 951 CJ

Size: 605 x 455 x 100 mm

Available:
LW 951 J (3 Tap Holes)



TOJA
LW 950 CJ

Size: 505 x 455 x 100 mm

Available:
LW 950 J (3 Tap Holes)



LW 574 J

Size: 420 x 420 x 125 mm



LW 573 J

Size: 420 mm diameter
Height: 125 mm

VESSEL COUNTER LAVATORY



LW 578 J

NEW

Size: 420 mm diameter
Height: 125 mm



LW 648 CJ

Size: 795 x 495 x 115 mm

Available:
LW 648 J (3 Tap Holes)



LW 640 NJ

Size: 505 x 505 x 155 mm

Available:
LW 640 NCJ (1 Tap Hole)



LW 631 J

Size: 710 x 410 x 125 mm



LW 630 J

Size: 600 x 370 x 110 mm



LW 340 CJ

Size: 750 x 500 x 120 mm

Available:
LW 340 J (3 Tap Holes)



LW 643 J

Size: 584 x 384 x 100 mm



LW 523 NJ

Size: 430 mm diameter
Height: 160 mm



OMNI+
LW 896 J

Size: 620 x 430 x 130 mm



OMNI+
LW 895 J

Size: 430 mm diameter
Height: 130 mm



OMNI+
LW 893 CJ

Size: 430 mm diameter
Height: 130 mm



LW 536 CJ

Size: 454 mm diameter
Height: 100 mm



LW 645 JN

Size: 660 x 420 x 75 mm



L 710 CTRE

Size: 500 x 450 x 135 mm



LW 649 CJ

Size: 500 x 440 x 85 mm

Available:
LW 649 J (3 Tap Holes)



L 652 D

Size: 350 mm diameter
Height: 90 mm

SEMI RECESSED LAVATORY



LW 533 J

Size: 430 mm diameter



LW 829 CJ

Size: 580 x 480 mm

Available:
LW 829 J (3 Tap Holes)



AVANTE
LW 824 CJ

Size: 550 x 460 mm

Available:
LW 824 J (3 Tap Holes)



LW 660 CJ

Size: 550 x 460 mm

Available:
LW 660 J (3 Tap Holes)



LW 528 NJ

Size: 440 mm diameter
Height: 75 mm



LW 526 NJ

Size: 430 mm diameter
Height: 75 mm



LW 518 J

NEW

Size: 500 mm diameter
Height: 165 mm



LW 641 NJ

Size: 505 x 505 mm

Available:
LW 641 NCJ (1 Tap Hole)



LW 646 J

Size: 600 x 400 mm



LW 647 CJ

Size: 520 x 420 mm

Available:
LW 647 J (3 Tap Holes)



LW 642 CJ

Size: 415 x 485 mm

Available:
LW 642 J (3 Tap Holes)

SELF RIMMING LAVATORY



OMNI+ LW 899 J

Size: 595 x 485 mm

Available:
LW 899 CJ (1 Tap Hole)



LW 509 J

NEW

Size: 600 x 450 mm



L 521 V1A

Size: 540 x 490 mm

Available:
L 521 V3 (1 Tap Hole)
L 521 (3 Tap Holes)



LW 565

Size: 445 x 366 mm



LW 519 J

NEW

Size: 450 mm diameter
Height: 165 mm



LW 530 J

Size: 450 mm diameter



L 568 V3

Size: 486 x 409 mm



LW 648 CJT1

Size: 795 x 495 mm

Available:
LW 648 JT1 (3 Tap Holes)



LW 781 J

Size: 635 x 462 mm

Available:
LW 781 CJ (1 Tap Hole)



LW 538 RCB

Size: 482 x 482 mm



LW 639 CJ

Size: 600 x 490 mm

Available:
LW 639 J (3 Tap Holes)

UNDER COUNTER LAVATORY



ALISEI
LW 279 J

NEW

Size: 1550 x 470 x 175 mm



ALISEI
LW 278 JL

NEW

Size: 850 x 470 x 175 mm



ALISEI
LW 278 JR

NEW

Size: 850 x 470 x 175 mm



LW 539 JT1

Size: 410 mm diameter (Opening)

Available:
LW 539 CJ (1 Tap Hole)



LW 587 J

Size: 457 x 355 mm (Opening)



LW 549 J

Size: 630 x 345 mm (Opening)



L 548

Size: 530 x 350 mm (Opening)



L 546

Size: 480 x 330 mm (Opening)



LW 651 J

Size: 500 x 350 mm (Opening)



LW 598 J

NEW

Size: 880 x 375 mm (Opening)



LW 595 J

Size: 615 x 295 mm (Opening)



LW 592 J

Size: 450 x 295 mm (Opening)



WENZAL
LW 931 J

Size: 513 x 335 mm (Opening)



LW 540 J

Size: 520 x 345 mm (Opening)

PEDESTAL LAVATORY



LE MUSE
LW 817 J

Size: 700 x 460 x 900 mm



WENZAL
LW 930 J / LW 930 FJ

Size: 730 x 500 mm

Available:
LW 930 CJ (1 Tap Hole)



LW 780 J / LW 780 FJ

Size: 686 x 500 mm

Available:
LW 780 CJ (1 Tap Hole)



LW 668 J / LW 668 FJ

Size: 700 x 565 mm



LW 825 J / LW 825 FJ

Size: 700 x 550 mm

Available:
LW 825 CJ (1 Tap Hole)



AVANTE
LW 820 J / LW 820 FJ

Size: 700 x 550 mm

Available:
LW 820 CJ (1 Tap Hole)



LW 242 J / LW 239 FJ

Size: 660 x 545 mm

Available:
LW 242 CJ (1 Tap Hole)



LW 241 CJ / LW 239 FJ

Size: 580 x 500 mm

Available:
LW 241 J (1 Tap Hole)



LW 236 CJ / LW 239 FJ

Size: 530 x 465 mm



WENZAL
LW 930 J / F 930 WCP

Size: 730 x 500 mm

Available:
LW 930 CJ (1 Tap Hole)



LW 825 J / LW 825 HFJ

Size: 700 x 550 mm

Available:
LW 825 CJ (1 Tap Hole)



AVANTE
LW 820 J / LW 820 HFJ

Size: 700 x 550 mm

Available:
LW 820 CJ (1 Tap Hole)



LW 242 J / LW 242 HFJ

Size: 660 x 545 mm

Available:
LW 242 CJ (1 Tap Hole)



LW 241 CJ / LW 242 HFJ

Size: 580 x 500 mm

Available:
LW 241 J (3 Tap Holes)



LW 240 CJ / LW 240 HFJ

Size: 500 x 350 mm

WALL HUNG LAVATORY



ALISEI
LW 273 CJ

NEW

Size: 420 x 420 x 170 mm



LE MUSE
LW 810 CJ

Size: 450 x 400 mm



LE MUSE
LW 811 CJ

Size: 550 x 485 mm



LE MUSE
LW 815 CJ

Size: 605 x 510 mm



TOJA
LW 954 CJL

Size: 900 x 460 x 100 mm



TOJA
LW 954 CJR

Size: 900 x 460 x 100 mm



OMNI+
LW 898 J

Size: 455 x 430 x 310 mm

Available:
LW 898 CJ (1 Tap Hole)



OMNI+
LW 897 J

Size: 455 x 430 mm

Available:
LW 897 CJ (1 Tap Hole)



LW 640 NCJT

Size: 505 x 505 mm

Available:
LW 640 NJT (3 Tap Holes)



LW 103 JT1

For The Disabled
Size: 580 x 550 mm



LW 575 JR

Size: 405 x 470 mm



L 650 D

Size: 750 x 300 mm



LW 240 CJ

Size: 500 x 350 mm



LW 236 CJ

Size: 530 x 465 mm

Available:
LW 236 JT3 (2 Tap Holes)



LW 247 CJ

Size: 500 x 430 mm

WALL HUNG LAVATORY



LW 211 CJ

Size: 500 x 400 mm



LW 230 J

Size: 500 x 400 mm



L 38 V1

Size: 500 x 330 mm



LW 7 CJ

Size: 601 x 475 mm



LW 248 JT1

Size: 510 x 260 mm

Available:
LW 248 JL (Left Tap Hole)
LW 248 JR (Right Tap Hole)



L 529 V1

Size: 430 x 435 mm

Available:
L 529 V3 (1 Tap Hole)



LW 246 J

Size: 450 x 305 mm



USWN 900 AS

Wall Hung Urinal with Built-In Sensor
with E-Water
AC 220V Operated
Inlet: Back
Size: 380 x 420 x 920 mm



USWN 900 A

Wall Hung Urinal with Built-In Sensor
Battery Operated
Inlet: Back
Size: 380 x 420 x 920 mm

Available:
USWN 900 AE (AC Type)



UW 930 HJM

Concealed Urinal Sensor (AC Type)
Fuzzy Logic Control Software
Inlet: Back
Moslem Type
Size: 420 x 362 x 744 mm



UW 930 HJ

Concealed Urinal Sensor 220 V
Fuzzy Logic Control Software
Inlet: Back
Size: 420 x 362 x 744 mm



UW 447 HJNM

Concealed Urinal Sensor (AC Type)
Fuzzy Logic Control Software
Inlet: Back
Moslem Type
Size: 444 x 356 x 685 mm



UW 447 HJT1

Concealed Urinal Sensor 220 V
Fuzzy Logic Control Software
Inlet: Back
Size: 444 x 356 x 685 mm



UW 350 HJT1M

Concealed Urinal Sensor (AC Type)
Fuzzy Logic Control Software
Inlet: Back
Moslem Type
Size: 370 x 360 x 740 mm



UW 350 HJT1

Concealed Urinal Sensor 220 V
Fuzzy Logic Control Software
Inlet: Back
Size: 370 x 360 x 740 mm



UW 352 J

Concealed Urinal Sensor 220 V
Fuzzy Logic Control Software
Inlet: Back
Size: 345 x 355 x 780 mm

URINAL



UW 811 HJ

Concealed Urinal Sensor 220 V
Fuzzy Logic Control Software
Inlet: Back
Size: 325 x 340 x 560 mm



U 57 K

Concealed Urinal Sensor 220 V
Fuzzy Logic Control Software
Inlet: Back
Size: 330 x 310 x 737 mm



UW 58 HJM

Concealed Urinal Sensor (AC Type)
Fuzzy Logic Control Software
Inlet: Back
Moslem Type
Size: 330 x 365 x 690 mm



UW 58 HJ

Concealed Urinal Sensor 220 V
Fuzzy Logic Control Software
Inlet: Back
Size: 330 x 365 x 690 mm



UW 930 JM

Moslem Type
Size: 420 x 362 x 744 mm



UW 930 J

Size: 420 x 362 x 744 mm



U 370 M

Moslem Type
Size: 460 x 360 x 820 mm



U 370

Size: 460 x 360 x 820 mm



UW 447 JNM

Moslem Type
Size: 444 x 356 x 685 mm



UW 447 JT1

Size: 444 x 356 x 685 mm



UW 58 JM

Moslem Type
Size: 330 x 365 x 690 mm



UW 58 J

Size: 330 x 365 x 690 mm



U 57 M

Moslem Type
Size: 330 x 310 x 605 mm



U 57

Size: 330 x 310 x 605 mm



U 104

Size: 320 x 340 x 540 mm



AW 115 J

Size: 100 x 350 x 760 mm



A 100

Size: 100 x 350 x 760 mm

BIDET



ALISEI
BW 275 J

NEW

Wall Faced



LE MUSE
BW 813 J

Wall Faced



BW 914 J

Wall Faced



BW 827 J

Wall Faced

Available:
BW 827 JT1 (3 Tap Holes)



SUPERIOR
B 436

Wall Faced



BW 630 J

Wall Faced



BW 668 J

Wall Faced



AVANTE
BW 824 J

Wall Faced



AVANTE
BW 823 J

Wall Faced



BW 860 J

Wall Faced



BW 5 J

Wall Faced



ALISEI
BW 274 J

NEW

Wall Hung



LE MUSE
BW 812 J

Wall Hung



AVANTE
BW 822 NJT1

Wall Hung



BW 800 J

Wall Hung



BW 620 J

Wall Hung



BW 875 J

Wall Hung

BATHTUBS



FBY 1860 HPWE

Anti Slip
Size: 1800 x 900 x 540 mm
Capacity: 226 liters

Pop-Up Waste: Included
Accessories: DB210C (Optional)



FBYN 1826 CPWE

Anti Slip
Size: 1800 x 800 x 575 mm
Capacity: 220 liters

Pop-Up Waste: Included



FBY 1760 CHPE

Anti Slip
Size: 1720 x 900 x 530 mm
Capacity: 270 liters

Pop-Up Waste: 9008LN (Optional)



FBYN 1810 CPE

Anti Slip
Size: 1800 x 800 x 470 mm
Capacity: 172 liters

Pop-Up Waste: 9008LN (Optional)

Available:
FBYN 1810 CHPE
Enameled Cast Iron Bathtub
With Hand Grips



FBYN 1710 CPE

Anti Slip
Size: 1700 x 750 x 470 mm
Capacity: 187 liters

Pop-Up Waste: 9008LN (Optional)



FBYN 1700 PE

Anti Slip
Size: 1700 x 750 x 500 mm
Capacity: 258 liters

Pop-Up Waste: 9008LN (Optional)



FBYN 1710 NPE

Anti Slip
Size: 1700 x 750 x 470 mm
Capacity: 187 liters

Pop-Up Waste: 9008LN (Optional)



FBY 1520 PE

Anti Slip
Size: 1517 x 750 x 465 mm
Capacity: 195 liters

Pop-Up Waste: 9008LN (Optional)



PPY 1530 WV1

Anti Slip
Size: 1500 x 1500 x 660 mm
Capacity: 276 liters

Pop-Up Waste included: DB501R-2A



PPY 1610 HPWE

Anti Slip
Size: 1600 x 810 x 630 mm
Capacity: 179 liters

Pop-Up Waste included: DB501R-2A



PPY 1710 HPWE

Size: 1700 x 800 x 595 mm
Capacity: 184 liters

Pop-Up Waste included: DB501R-2A



PPY 1930 PWE

Size: 1900 x 950 x 650 mm
Capacity: 276 liters

Pop-Up Waste included: DB501R-2A

Available:
PPY 1930 HPWE
Pearl Bathtub With Hand Grips



DUO COMFORT

Size: 1800 x 800 x 420 mm
Capacity: 240 liters

Pop-Up Waste: 9008LN (Optional)



FB 1700 - 80N

Anti Slip
Hand Grips
Size: 1700 x 800 x 410 mm
Capacity: 210 liters

Pop-Up Waste: 9005N (Optional)



FB 1700 - 75

Anti Slip
Size: 1700 x 750 x 395 mm
Capacity: 180 liters

Pop-Up Waste: 9005N (Optional)



FB 1700 - 70

Anti Slip
Size: 1700 x 700 x 385 mm
Capacity: 190 liters

Pop-Up Waste: 9005N (Optional)



FB 1500 - 70

Anti Slip
Size: 1500 x 700 x 390 mm
Capacity: 170 liters

Pop-Up Waste: 9005N (Optional)

BATHTUBS



TABLE
PJY 1704 HPWE

Size: 1700 x 800 x 585 mm
Capacity: 335 liters

Pop-Up Waste: Included

Available:
PJY 1704 PWE
Reinforced Marble Bathtub
Without Hand Grips



ARC
PJY 1804 PWE

Size: 1800 x 850 x 585 mm
Capacity: 400 liters

Pop-Up Waste: Included

Available:
PJY 1804 HPWE
Reinforced Marble Bathtub
With Hand Grips



EGG
PJY 1814 PWE

Size: 1800 x 900 x 665 mm
Capacity: 375 liters

Pop-Up Waste: Included

Available:
PJY 1814 HPWE
Reinforced Marble Bathtub
With Hand Grips

SINKS



SK 322 E

Service Sink
Size: 560 x 456 mm



SK 33

Slop Sink
Size: 508 x 660 mm



SK 508

Laundry Sink
Size: 595 x 500 mm

TOTO

MASTER CATALOG 2015



TOTO

TECHNOLOGY THAT MATTERS


TOTO

TECHNOLOGY THAT MATTERS

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TOTO


TOTO

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In this day and age, the word technology is often associated with elaborate machines, micro devices and digital interaction. While they are programmed to expedite and potentially economize, their very efficacy could leave us feeling alienated, intimidated, and even fearful. Oftentimes, these attempts to reduce human error end up eliminating the human element all together. In the end, we're left to wonder if there's purpose beneath the sleek façade and theatrical features.

At TOTO, we believe in crafting technology that matters. We believe that technology is more than just robots and remotes. Much like art, technological advancements should also capture its zeitgeist. It should reflect the progress of its civilization, not dismiss it. It should enhance, not compromise comfort. It should make you feel understood. These thoughts inform our research and motivate us to do better. Our purpose is not to merely launch the latest technological breakthrough but to create thoughtful, innovative products that will enrich the human experience.

TOTO



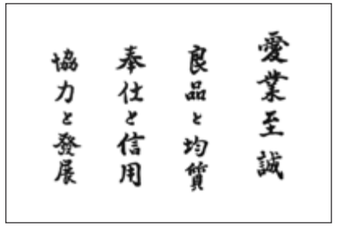


1

ABOUT TOTO

Founded in 1917 by Kazuchika Okura, TOTO is the world's largest toilet manufacturer. Driven by Japan's spirit of perfection, the company has not only pioneered the development of modern sanitary ware, it has also changed the way we experience the bathroom. Over the years, its unparalleled commitment to quality and innovation has earned the company its reputation as a trendsetting and trustworthy go-to brand for private homes and commercial establishments alike.

Guided by the four pillars of our company motto, TOTO continues to strive for perfection in everything we do:



"Take pride in your work, Strive to do your best, Quality and Uniformity, Service and Trust, Cooperation and Prosperity."





TOTO's first overseas factory was established in Indonesia in 1977 under PT. Surya Toto Indonesia. It is now one of the largest sanitary manufacturing facilities in the world with eight state-of-the-art kilns and a fully automated line.

To highlight the company's commitment to the environment, our factories are ISO 14001 certified for its environmentally responsible management system. The facility recycles its own water supply and uses Liquefied Natural Gas (LNG) to power its kilns, effectively minimizing exhaust emission.

The adoption of advanced technology to make large-scale manufacturing an environmentally responsible practice once again highlights the company's philosophy of making both the home and the world a better place.





1917

The company is established by Kazuchika Okura under the name of TOYO TOKI CO., Ltd., which is later renamed to TOTO. Five years previously, in 1912, Okura had set up a laboratory to develop the kind of sanitary ceramics that had become common in Europe and America. With its first sales, Okura's company begins challenging accepted notions of cleanliness, something that TOTO continues to do today.

1923

The Great Kanto Earthquake strikes, devastating Tokyo. A sewage system is built during the reconstruction and the demand for sanitary ware grows rapidly.

1946

After World War II, TOTO begins to manufacture metal fittings and faucets as well as ceramics. Ever since, innovation in the field of precision machining technology has gone hand-in-hand with developments in the firing and casting of sanitary ware as two of TOTO's core businesses.

1964

Japan is in the midst of its economic miracle when it hosts the 1964 Tokyo Olympics, and is enjoying the construction boom that accompanies it. TOTO is again at the forefront of bathroom technology, developing the prefabrication methods necessary to meet the need for mass production, which saves time and energy on construction. The modular prefabricated bathrooms TOTO creates for the 1,044 rooms in Tokyo's Hotel New Otani, opened for the Olympics, shows how the company has perfected the combination of technology and design.

1977

TOTO's first overseas factory opens: PT. Surya TOTO Indonesia.





1980

TOTO launches the WASHLET, providing consumers with a whole new level of cleanliness and comfort. It quickly becomes a Japanese cultural and commercial sensation.

1981

Following in the wake of the WASHLET, TOTO starts moving its advanced technology into other products by introducing high-end modular kitchens.

1990

TOTO begins trading in the USA, having already extended into Indonesia, Korea, Thailand, Taiwan and Hong Kong. TOTO expands business to China in 1994.

1993

The launch of the NEOREST toilet brings about the fullest realisation yet of the principle of Clean Technology, incorporating the WASHLET and a comprehensive range of TOTO's innovations into a bathroom of the highest aesthetic and performance quality.

1998

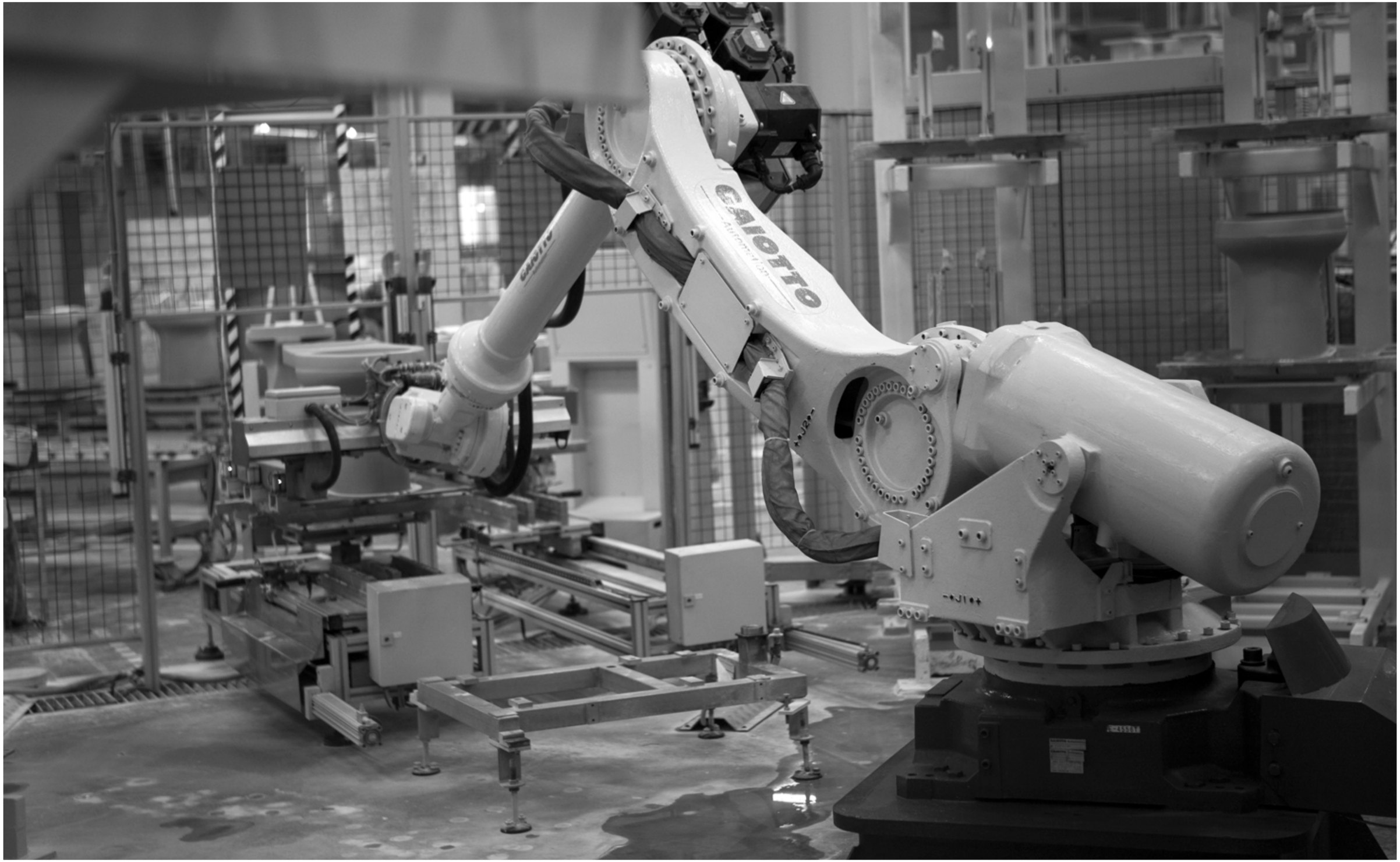
TOTO launches HYDROTECT, a patented photocatalytic technology. The material's surface self-cleans and breaks down pollutants in the air, making it ideal for external use. Easy to clean, it eliminates odours and bacteria – making it ideal for internal use, too.

2006

The TOTO Universal Design Research Centre is built. Its purpose is to create new products through an extensive process of customer dialogue and feedback.

2009

TOTO launches in Europe at the ISH Exhibition in Frankfurt, 10-14 March.


GAIOTTO

2

DESIGN

Design has become an integral part in our everyday lives. It is more than a superfluous façade but a manifestation of superior creativity, one that blends beauty and function in one seamless form.

At TOTO, design is not about adhering to trends but innovating a solution for modern living. Our designs are inspired and informed by your everyday routine to create a personal sanctuary where everything is exactly the way you want them.

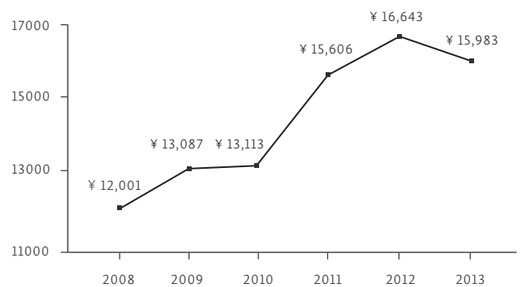






Our Research and Development center continues to create new and improved products that blend form and function. Located in Kokura, a port town on the northern edge of Japan's Kyushu Island, TOTO's headquarters serve as the company's mother factory and main think tank. This is where TOTO's breakthrough innovations, such as the Washlet and Neorest were conceived. The company allocates at least 400 million dollars annually to R&D in an attempt to continually refine and revolutionize your bathroom experience.

At TOTO, the design process is a thoughtful exploration of visual ideas that takes user experience into account. Every superfluous aspect is eradicated so that the appearance of a product never obscures its function. It is more than just add-on ornamentation. Over the years, we have registered countless groundbreaking patents , all of which serve as a testament to our tireless pursuit of achieving that perfect balance between utilitarian purpose and pure, unadulterated beauty.



TOTO Research and Development

EASY CLEANING

Inspired by Japan's obsession with order and cleanliness, our toilets are designed to ensure easy maintenance while adhering to the strictest hygiene standards.

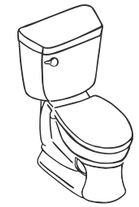
COMPACT DESIGN

Our one-piece toilet features a single, integrated tank and bowl design, which allows for a more compact dimension that is easier to clean.





One piece toilet



Close coupled toilet

SKIRTED DESIGN

The skirted design conceals the unsightly trapway, creating a sleek silhouette that eliminates hard-to-reach places.





Conceals trapway, easy to clean



Exposed trapway

RIMLESS DESIGN

The rimless design prevents dirt and germs from getting trapped, making for a more attractive, not to mention more hygienic toilet.





TOTO rimless design



Conventional toilet rim

CURVILINEAR DESIGN

The curvilinear design of our lavatories minimizes corners and edges that are difficult to clean.

Our ceramic products also feature an extremely low water absorbency level, which minimizes the accumulation of deposits, hence making them more hygienic and long lasting.



ELEVATED DESIGN

The Wall Hung toilet is elevated from the floor, creating a more open sense of space while allowing you to easily clean the floor.





Easily clean the floor

SPACE SAVING

As the world's population continues to increase and we become more space-strapped, design plays a crucial role in providing an efficient yet comfortable personal space.

CONCEALED SYSTEM

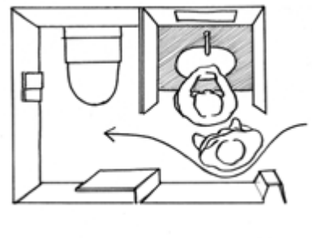
The Wall Hung toilet conceals its water tank behind the wall, thus freeing up extra space in the bathroom.



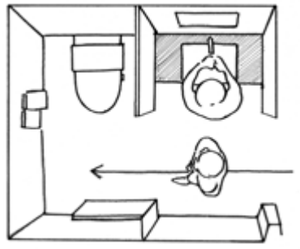
SEMI-RECESSED

The semi-recessed lavatory can be easily fitted into an existing countertop for extra storage or space.





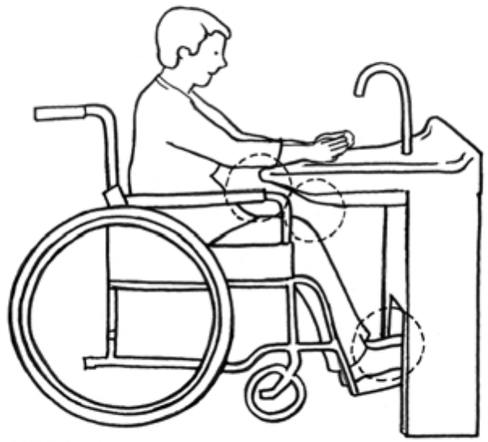
Standard Lavatory



Semi-recessed lavatory

BARRIER FREE

Our barrier free products are created to ensure maximum comfort for the aged and the less abled. The concave counter design allows for better, unrestricted access.



3

TECHNOLOGY

Innovation is more than newness or nowness. It is an ongoing dialogue with the environment we live in, and our environment is changing at an alarming rate. It is now more imperative than ever to conserve resources and minimize CO_2 emissions.

TOTO Technology is invented to protect the planet as well as push boundaries so you won't have to choose one over the other. All of our features are the result of careful and thoughtful planning so that they may be of service to you and the environment.





TOTO GLOBAL ENVIROMENTAL VISION

Since its founding, TOTO has always been aware of the tremendous value of water. Today, with the increasing threat of of global warming and prevalence of water shortages, we are compelled to redefine our relationship with this essential resource. Now more than ever, TOTO strives to help sustain the environment through the development of high-quality, water-efficient products.

Turning on a faucet and taking a shower may seem like ordinary activities but they are also opportunities to save water and reduce CO_2 emissions. Adding “protection of water resources” to our list of Global Environment Goals highlights our effort to produce technologies that facilitate environmental sustainability.

TOTO will work as one with various local communities to meet these crucial objectives. We sincerely hope that our involvement will lead to better living and consequently, a better tomorrow.

WATER CONSUMPTION FACTS AND FIGURES

2.5%
Although 70 percent of the world is covered by water, only 2.5 percent of it is fresh.

1%
Of that, only 1 percent is easily accessible.

783
783 million of people do not have access to clean and safe water.

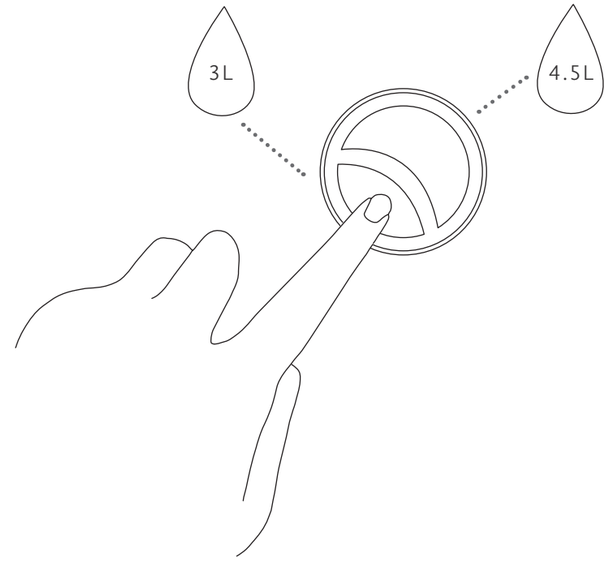
1.8
By 2025, an estimated 1.8 billion people will live in areas where water is scarce.

2.5
There are 2.5 billion people who do not have access to proper sanitation.

This awareness, coupled with TOTO's spirit of perfection has resulted in technologically advanced products that are also eco-friendly. By using TOTO products, you're helping the environment without even thinking about it.

DUAL FLUSH

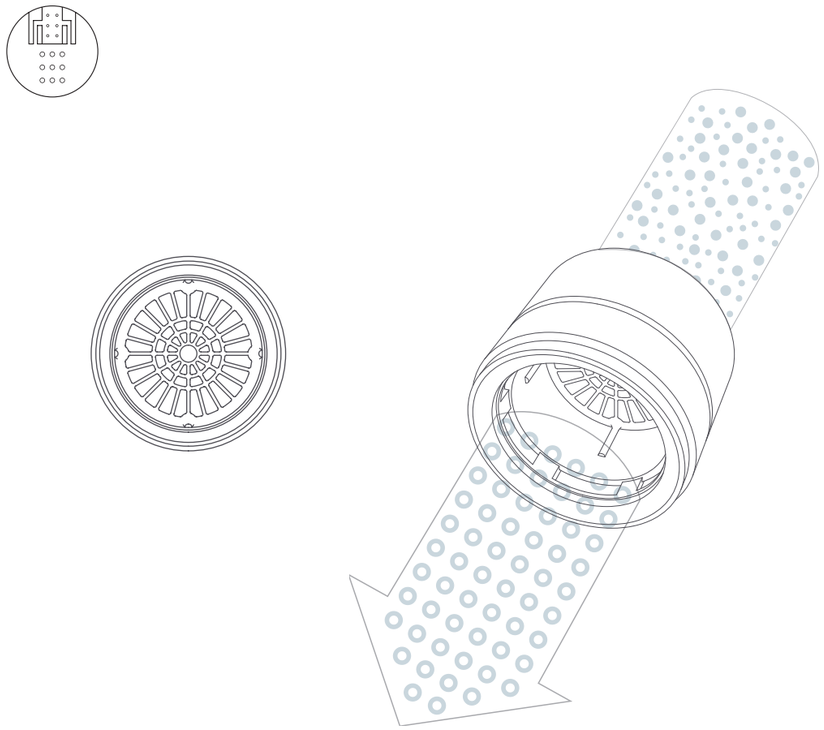
4.5
ECO



As early as 1976, TOTO released a new toilet that uses 13 liters with each large flush, achieving water savings of 35% compared to earlier toilets. Since then, we have continued to increase water efficiency. In 1999, TOTO launched its first dual flush technology, minimizing water usage to 6 ltr/3 ltr. Now, our toilets use the 4.5 ltr/3 ltr dual flush system for solid and liquid waste respectively.

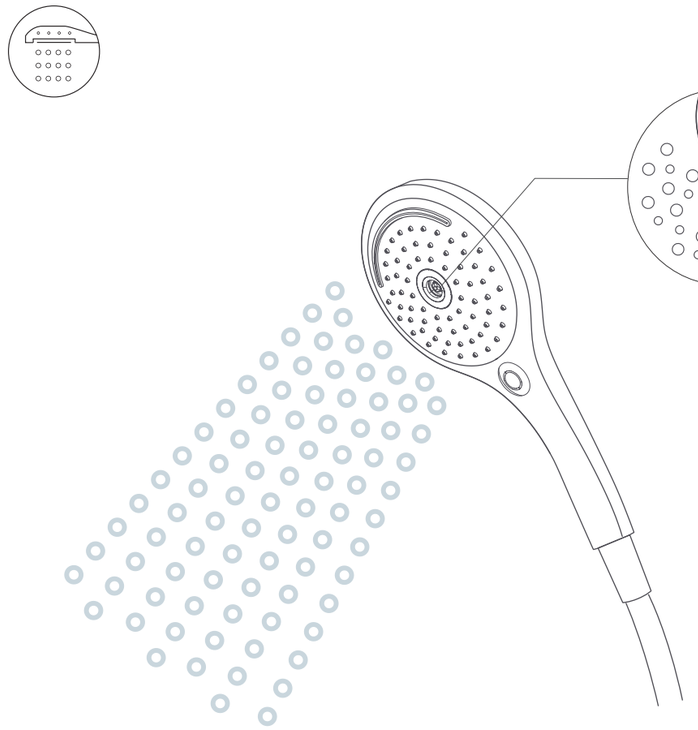
Despite these breakthroughs, we're careful not to compromise comfort and functionality. All of our toilets have passed some of the world's toughest flushing standards including the United States, Japan, and Singapore. Each and every single toilet is evaluated against our strict Quality Control standards before we install them in your homes.

ECOCAP



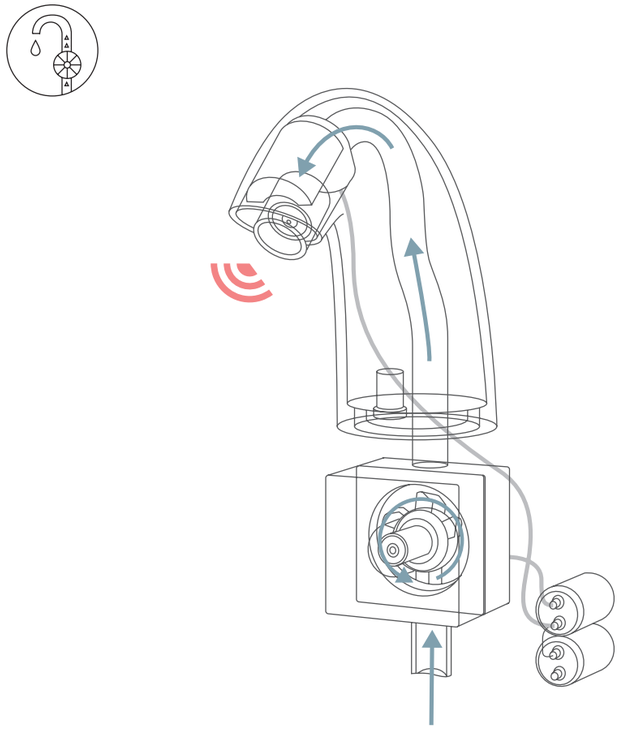
Our EcoCap technology uses an ingenious water outlet cap that mixes air with water to reduce water consumption without any loss in stream volume. EcoCap enables full flow rates with just 3.6 liters of water, only 1/3 of the water from other normal faucets. Despite the low water consumption, EcoCap faucets have a full, pleasurable water jet.

AERIAL SHOWER



The aerial shower technology aerates the water to create bigger water droplets for a more luxurious feel. Air is drawn in through the showerhead and added to the water, causing them to increase in volume. You will feel as though you're being rinsed with a generous stream of water, making your shower experience all the more enjoyable.

SELF POWER



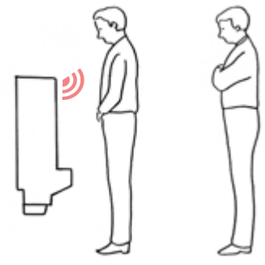
Aqua Auto faucets incorporate two technologies for public facilities. They work together to optimize power and water-saving performance.

Aqua Auto harnesses power through hydroelectric power generation so no power supply is required. The hydroelectric power uses water flow to maintain its rechargeable battery. So, the more you use the sensor faucet, the longer it lasts.

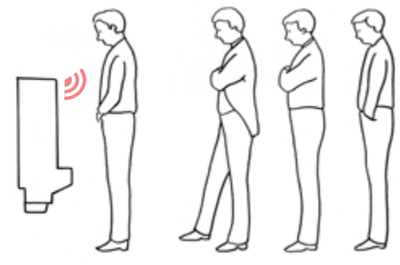
The automatic micro sensor—positioned at the tip of the spout—is operated using the generated power, preventing water from being left running, thus helping to conserve water. Accurate hand detection also means only the minimum necessary amount of water is used.

URINAL SENSOR

AUTO



When the urinal is seldom used, the flush volume is larger.



When the urinal is used frequently, the flush volume is smaller.

The urinal sensor technology is ideal for public facilities where strict hygiene standards need to be met and maintained. Its Fuzzy Logic Controlled software regulates the amount of water used based on the duration between each flushing to minimize water wastage while the non-contact auto flush system keeps the environment clean and safe to use.



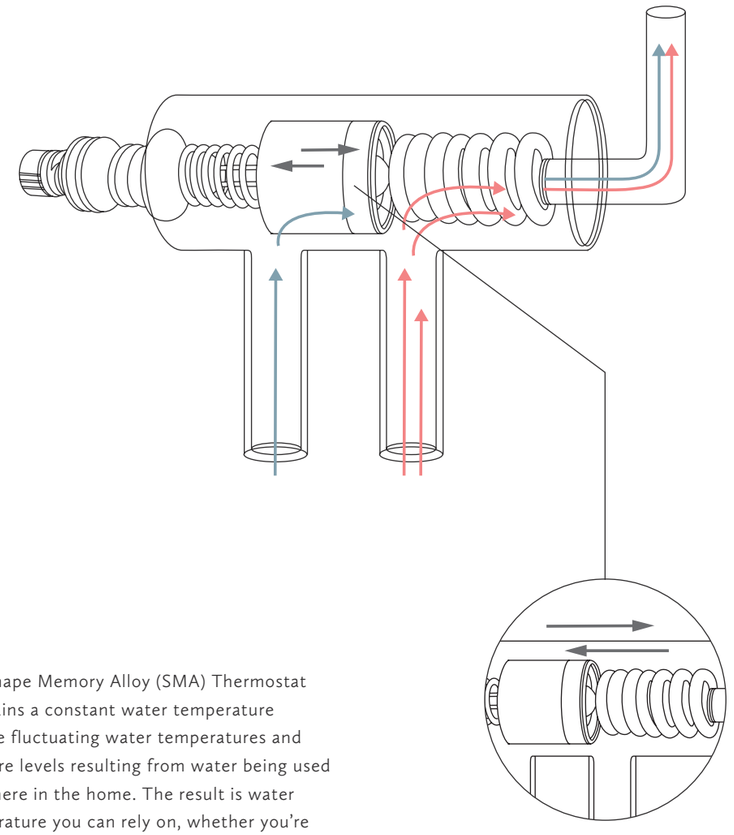
The Spreader Washing System washes with a smaller amount of water more efficiently compared to the normal plural hole model. Water flushes rapidly from the spreader and thoroughly washes the inside of the urinal.

PERFECTING THE BASICS

Technology is more than just tools and tricks. It's an evolution of thought. We don't believe in discarding the old for the new, we believe in perfecting the basics.

SMA THERMOSTAT

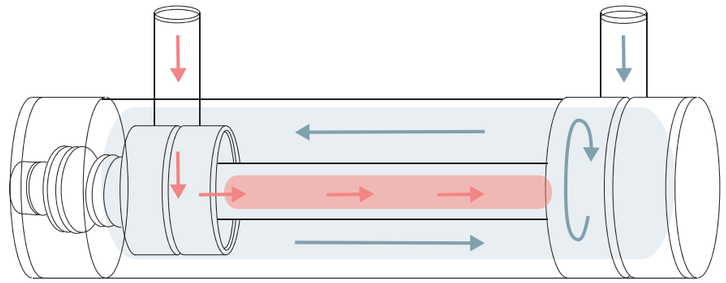




The Shape Memory Alloy (SMA) Thermostat maintains a constant water temperature despite fluctuating water temperatures and pressure levels resulting from water being used elsewhere in the home. The result is water temperature you can rely on, whether you're in the shower or washing your hands, without having to adjust it manually.

The special alloy of the control unit reacts faster than a conventional wax control unit. If the cold or hot water supply is interrupted, the SMA Thermostat will expand or contract to immediately readjust the temperature.

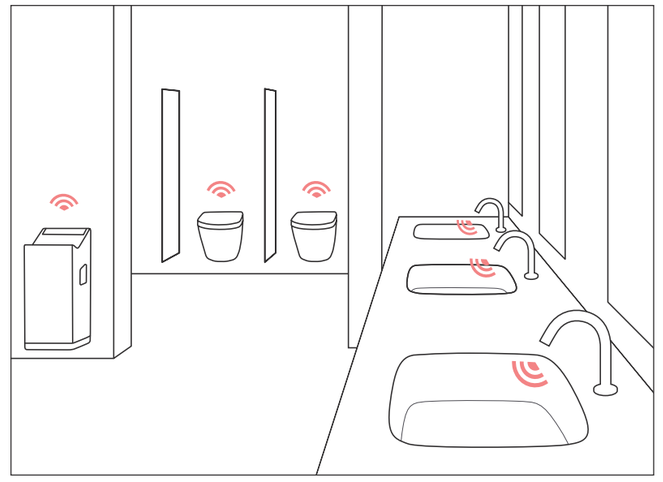
COOL TOUCH



The Cool Touch technology is a thoughtful feature that prevents scalding by shielding the hot water channels with cold water, hence making the surface cool to the touch.

TOUCH FREE

AUTO



In addition to being convenient and easy to use, sensor-based technologies offer a very decisive advantage: they allow for touch-free operation, an essential factor in ensuring hygiene, which is particularly suitable for public facilities.

Many people are reluctant to use toilets outside the home. They find them unhygienic, or are afraid of coming into contact with bacteria and germs, and falling ill as a result.

This is why hygienic sanitary solutions feature sensor-based technologies, which allow people to use toilets, faucets and hand dryers without touching them and keep contact with the skin to a minimum.

Aqua Auto faucets are perfect for this purpose because the sensor shuts off immediately when not used, thus eliminating the risk of water wastage when a user fails to turn the tap off.

PUSHING BOUNDARIES

Just as technology has revolutionized every aspect of contemporary life, TOTO's innovations are changing the way people think about and use bathrooms. TOTO's products allow for previously unimaginable levels of cleanliness, relaxation and contentment.

ECOWASHER

A precursor to the Washlet, the Eco Washer operates without electricity and can be easily fitted to various toilets.



With a simple turn of the knob, a nozzle will extend and spray a gentle aerated water jet for as long as needed. Turn the knob shut and the nozzle will automatically retract.



WASHLET

First launched in 1980, the WASHLET is TOTO's signature product.

The WASHLET is an electric seat with an integrated wand that uses warm water for personal cleansing. The temperature, position and pressure of the water can be customized according to personal preference.

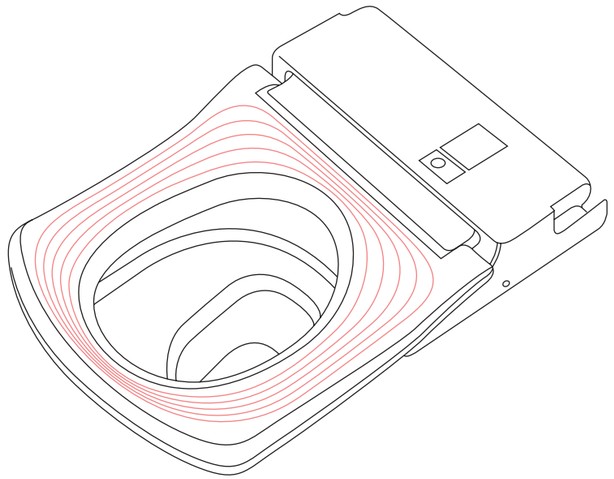






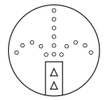
HEATED SEAT

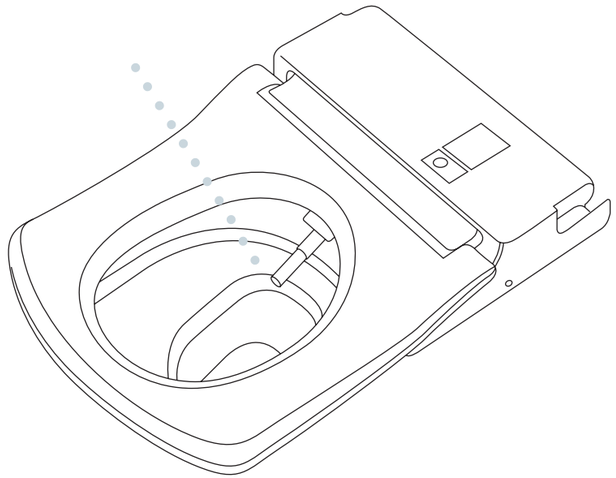




Not only can you adjust the temperature of the heated seat to suit your individual preference but it warms itself up even before you sit down. As soon as you get up, it automatically switches to an energy-saving mode, reducing the heat setting to minimum. There's even a smart energy-saving function, which automatically adapts itself to daily usage patterns.

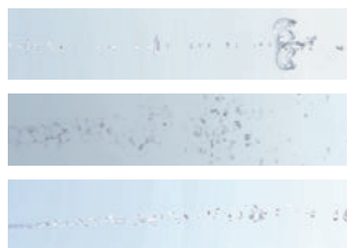
MULTI-FUNCTION NOZZLE



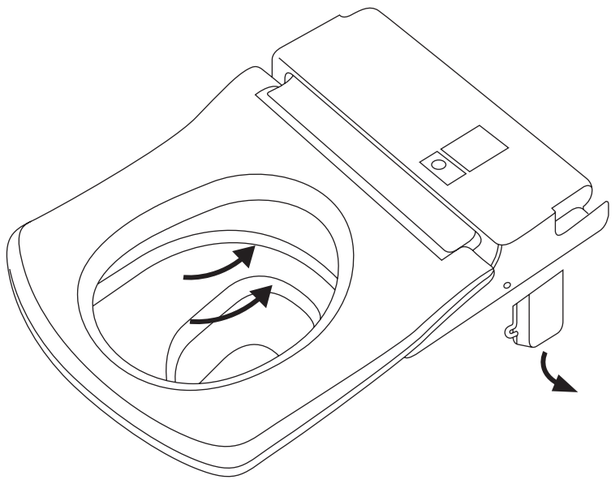


The WASHLET technology incorporates a unique wand that allows water to be used for personal cleaning in a way that leads to a completely new level of hygiene and comfort. Warm water is, after all, much more effective at cleaning than toilet paper. Its temperature and flow are easily adjustable by remote control and the wand self cleans before and after every use. The energy-saving mode can also be activated to increase efficiency.

Multi-function Nozzle

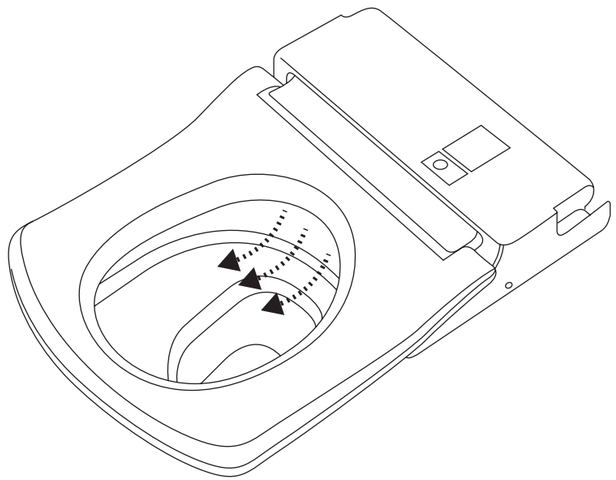


DEODORIZER



The air purifier ensures that the air around the toilet is kept fresh during and after use. The air is sucked in and passed through a powerful filter inside the WASHLET, which effectively eliminates odors.

DRYER



The dryer feature completes the hands-free experience by minimizing the use of toilet paper. Its temperature and strength can be adjusted to suit your individual preference, thereby ensuring the utmost comfort.

4

TRUST

Trust remains at the heart of everything we do,
from Research & Development to Customer Relations.
Our excellent track record is a testament to our
unrivaled determination to always deliver the best.















ONE STOP SOLUTION

Our comprehensive product range ensures a convenient and hassle-free shopping experience. TOTO provides everything you need to set up a harmonious bathroom system from a single, reliable supplier.

IMPECCABLE QUALITY

Staying true to the Japanese spirit of perfection, TOTO applies a strict 1:1 quality control ratio. This means that our team inspects each and every single product before they're released.

FULL CUSTOMER SUPPORT

TOTO products are subject to international warranty policies. Our service and repair team have been fully trained to provide the best possible service to our customers.

PROJECT SERVICE

As the world's leading sanitary ware brand, TOTO products are favored by leading architects and world-class establishments. Our products offer quality design as well as efficient features to accommodate large-scale projects. They are also easily customizable to suit your needs.

TOTO PROJECT LIST

COMMERCIAL

Fairmont Hotel Senayan Jakarta
Rafless Hotel Jakarta
Shangri-La Hotel Jakarta Reno Jakarta
The Hermitage Menteng Jakarta
18 Office Park Jakarta
St Moritz Office Tower Jakarta
Sahid Sudirman Centre Jakarta
The Tower Gatot Subroto Jakarta
Cemindo Tower, Rasuna Jakarta
Sinar Mas MSIG Tower Jakarta
Menara Sentraya Jakarta
Bahana Tower Jakarta
AIA Central Office Jakarta
Centennial Tower Jakarta
Noble House Office Jakarta
Grand Inna Putri Hotel Bali
Ritz Carlton Bali
Sofitel Nusa Dua Bali
The Heaven Suite Berawe Bali
Trans Resort Bali
Citadines Hotel Marvel City Surabaya
The Peak Hotel Pekanbaru

RESIDENTIAL

Ascott Service Apartment Jakarta
Botanica Apartment Jakarta
Capitol Park Residence Salemba Jakarta
Gmi Apartment Jakarta
Green Bay Condominium Jakarta
L' Avenue Apartment Jakarta
Satu 8 Apartment Jakarta
Senopati Suites Jakarta
Setiabudi Sky Garden Jakarta
Signature Park Grande Jakarta
Soho Pancoran Jakarta
Springhill Terrace Residences Jakarta
St. Moritz Apartment Jakarta
The Royale Springhill Residence Jakarta
Urbana Cinere Jakarta
Woodland Park Residence Jakarta
The H Residence Jakarta
M Gold Apartment Bekasi
Newton Hybird Park Bandung
Linden Tower Marvel City Surabaya



NEOREST

20 years ago, TOTO introduced NEOREST,
a revolutionary masterpiece that defines the modern
luxury bathroom. It combines the advanced features
found in the WASHLET along with more groundbreaking
upgrades while adhering to the highest standards
of design.



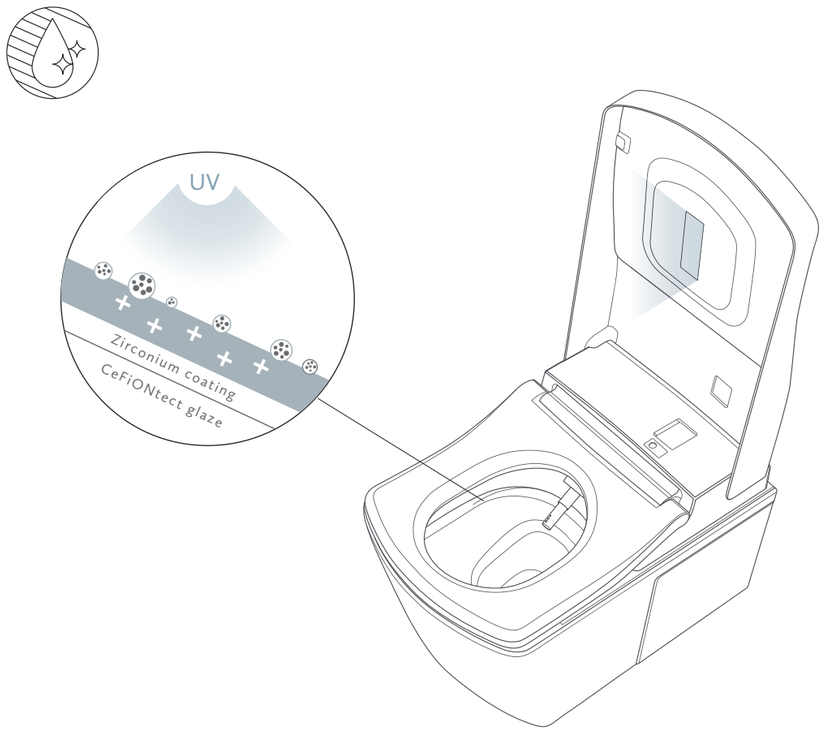
AUTO FUNCTION

AUTO



The NEOREST eases the stress of everyday life with its range of integrated, automatic, sensor-activated functions, including the self-opening and closing toilet lid, the automatic air purifier and the self-activating flush. The auto function also eliminates the need to touch the toilet, further increasing the level of hygiene.

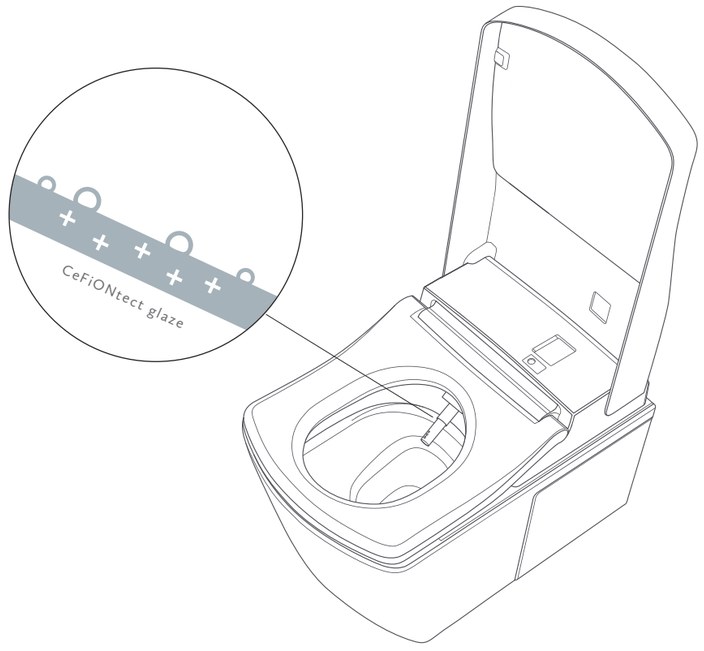
ACTILIGHT



Actilight consists of two phases that actively fight waste and bacteria. Prior to the first use, the WASHLET sprays the toilet bowl with water. Once it is flushed, the WASHLET sprays the bowl with electrolyzed water or Ewater+. This water has antibacterial properties that prevent waste from accumulating.

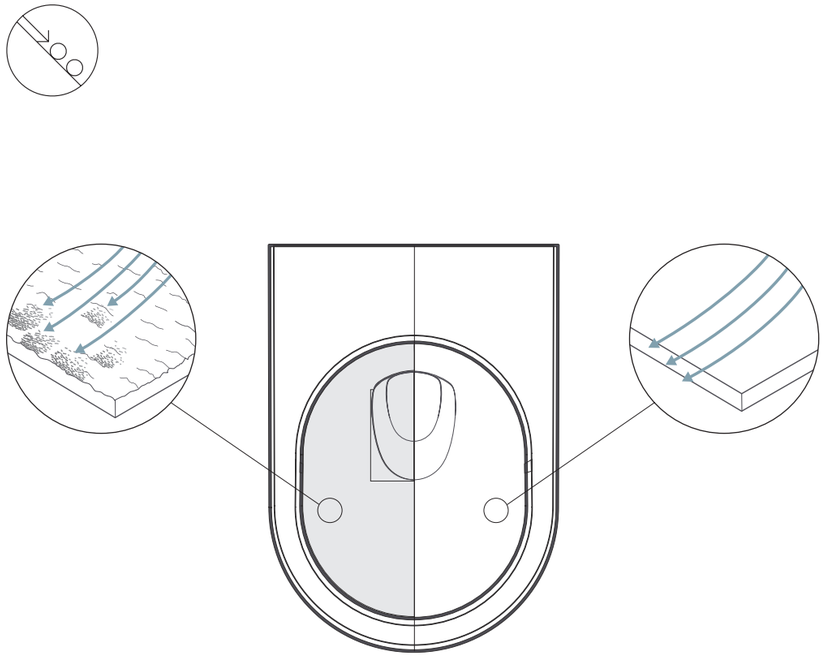
The toilet bowl also has a special hydrophilic zirconium-coated surface, which helps the electrolyzed water wash the waste away. The toilet lid features a UV light, which is activated once the lid is shut. This light triggers the decomposition process of the waste particles, resulting in a toilet that stays clean over the long term.

EWATER+



Regular water is electrolyzed to give it a slightly acidic pH value, and an antibacterial effect. The Ewater+ is completely environmentally friendly and can be safely returned to the water cycle.

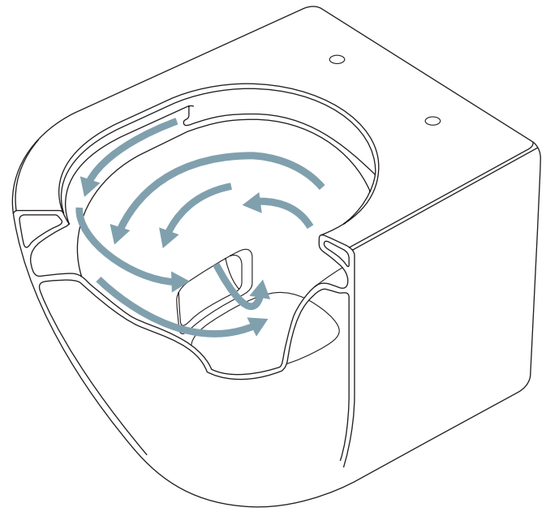
CeFIONtect



It's impossible to see with the naked eye but untreated ceramics have a rough, imperfect surface. No matter how much you clean it, bacteria buildup is ultimately inevitable. The CeFIONtect glaze is applied before the ceramics are fired, leaving a long-lasting finish that evens out the surface, thus preventing the buildup of mold, lime scale and waste matter.



TORNADO FLUSH & RIMLESS DESIGN



The Tornado Flush cleans and flushes both the rim and bowl in an innovative way. Instead of letting water pour down from the rim as in a traditional flush, the Tornado Flush projects three powerful jets of water from inside the bowl. This motion creates a whirlpool effect that cleans the entire surface, minimizing the need for chemical cleaning agents. It is also quiet and water-efficient.





PKZ 1800 A

NEOREST
Fully Automatic
Bathtub

Whirpool and Air Bath
Size: 1800 x 1400 x 755 mm



LW 991 A

NEOREST
Automatic Console
Vessel Counter
Lavatory

Size: 750 x 500 x 120 mm

AUTO



CW 994 P / TCF 994 WA

NEOREST LE I
Fully Automatic
One Piece Toilet

6/4.5 L Automatic Dual Flush

Bowl Shape: Elongated
Rough-In: 305 mm

AUTO



CES 992 WA

NEOREST XH1
Fully Automatic
One Piece Toilet

3.8/3 L Automatic Dual Flush

Bowl Shape: Elongated
Rough-In: 305 mm

AUTO



CES 9911 AX1

NEOREST EX
Fully Automatic
One Piece Toilet

6/4.5 L Automatic Dual Flush

Bowl Shape: Elongated
Rough-In: 305 mm

AUTO



CES 9786 JA

NEOREST AH
Fully Automatic
One Piece Toilet

3.8/3 L Automatic Dual Flush

Bowl Shape: Elongated
Rough-In: 305 mm

AUTO



TMC95V101R

NEOREST — Thermostatic Multi Function Shower Tower



YT 87 S7S

NEOREST — Bath Towel Bar (700 mm)



YH 87 S

NEOREST — Paper Holder



YH 63 SD

NEOREST — Toilet Paper Stand (Remote: Not Included)

AQUA AUTO

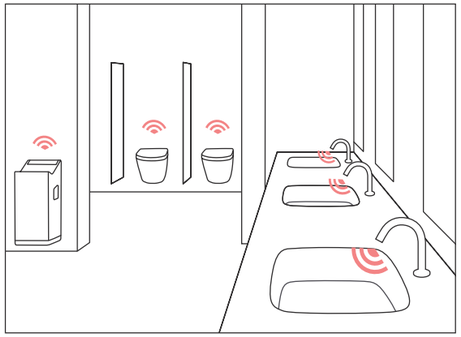
Our automatic features are designed to reflect the spirit of innovation that defines this generation. They allow for a completely hands-free bathroom experience to ensure maximum comfort and hygiene. Welcome to the future.



TOUCH FREE

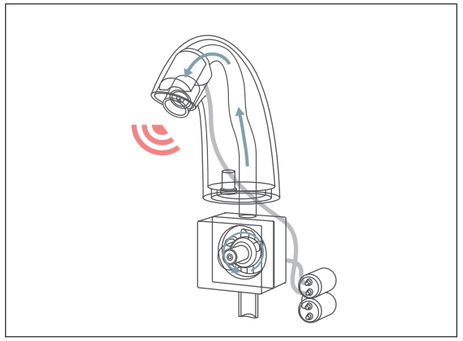
AUTO

In addition to being convenient and easy to use, sensor-based technologies offer a very decisive advantage: they allow for touch-free operation, an essential factor in ensuring hygiene, which is particularly suitable for public facilities.



SELF POWER

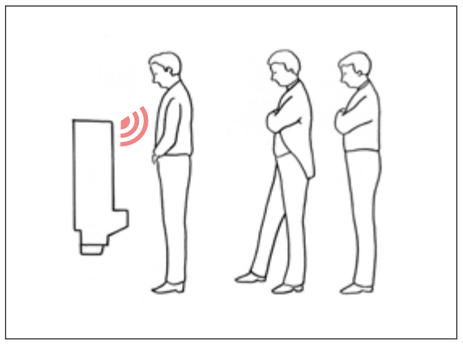
The automatic micro sensor—positioned at the tip of the spout—is operated using the generated power, preventing water from being left running, thus helping to conserve water. Accurate hand detection also means only the minimum necessary amount of water is used.



URINAL SENSOR

AUTO

The urinal sensor's Fuzzy Logic Controlled software regulates the amount of water used based on the duration between each flushing to minimize water wastage while the non-contact auto flush system keeps the environment clean and safe to use.





DLE 110 A1R V800 / TN78-9V800

AUTOMATIC FAUCET

Aqua Auto Faucet
Height : 166 mm

Available:
DLE 110 A2R V800 / TN78-9 V800
Aqua Auto Faucet
Height: 256 mm



DLE 105A V800 / TN78-9V800

AUTOMATIC FAUCET

Wall Mount Aqua Auto Faucet
Spout Length: 183.4 mm



DLE 118 BSH

AUTOMATIC FAUCET

Automatic Faucet Cold Only



TEN 40 AV800 / TN 78-9V800

AUTOMATIC FAUCET

Self Powered Aqua Auto Faucet

Available:
TEN 40 AV800 / TN 78-9V811
Self Powered Aqua Auto Faucet
(AC Type)



TEN 12 EV800 / TN 78-9V800

AUTOMATIC FAUCET

Self Powered Aqua Auto Faucet



DUE 106 UA

URINAL SENSOR

Urinal Sensor Flush Valve
(Concealed Type)
* Battery Operated
* Fuzzy Logic Controlled Software



DUE 106 UEA

URINAL SENSOR

Urinal Sensor Flush Valve
(Concealed Type)
* 220 Volt
* Fuzzy Logic Controlled Software



TEA 61 DR

URINAL SENSOR

Urinal Sensor Flush Device
(For Upgrading Manual Flush Valve)
* Battery Operated
* Fuzzy Logic Controlled Software



DUE 104 PBV1

URINAL SENSOR

Urinal Sensor Flush Device
(For Upgrading Manual Flush Valve)
* Battery Operated
* Fuzzy Logic Controlled Software



TYC 322 W

HAND DRYER

High Speed Hand Dryer
Size: 245 x 154 x 470 mm
Power Rate: AC 220 - 240 V
Power Consumption: 675 W



TYC 322 WF

HAND DRYER

High Speed Hand Dryer
Size: 245 x 154 x 226mm
Power Rate: AC 220 - 240 V
Power Consumption: 690 W



TYC 322 M

HAND DRYER

High Speed Hand Dryer
Size: 245 x 154 x 226 mm
Power Rate: AC 220 - 240 V
Power Consumption: 585 W



TYC 423 WC

HAND DRYER

High Speed Double Side
Hand Dryer
Size: 300 x 186 x 550 mm
Power Rate: AC 220 - 240 V
Power Consumption: 730 W

DESIGNER SERIES

To achieve greatness, one cannot possibly walk alone. We're constantly inspired by other revolutionary minds whose work reflects the same amount of passion and discipline that mirror our own.

Over the years, TOTO has had the privilege of working with some of the most promising design talents. Their exquisite eye, combined with our engineering expertise, have resulted in some of the most popular sanitary ware series. We love the challenge of realizing artistic visions into meaningful everyday objects as much as we are proud to have played a part in supporting the creative industry.

LE MUSE

FRANCESCO LUCCHESE



Graduated from the Politecnico di Milano, Francesco is the proud recipient of the first ADI prize for his 'Translazione' folding chair project. He has over 25 years of experience in the fields of architecture, interior and product design. He also teaches at the Politecnico di Milano under the Faculty of Design and is part of the managing board of ADI Lombardia.

Francesco designs the Le Muse series, which is characterized by its sinuous curvilinear shape.







CW 811 PJ / SW 811 JP

LE MUSE
Dual Flush
Close Coupled Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)

Available:
(S-Trap Installation)



CW 812 J

LE MUSE
Wall Hung
Single Bowl Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 210 mm



CW 813 PJ

LE MUSE
Wall Faced
Single Bowl Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm



BW 812 J

LE MUSE
Wall Hung
Bidet



BW 813 J

LE MUSE
Wall Faced
Bidet



LW 816 J

LE MUSE
Console
Vessel Counter
Lavatory

Size: 1400 x 400 x 150 mm



LW 817 J

LE MUSE
Pedestal Lavatory

Size: 700 x 460 mm



LW 813 CJ

LE MUSE
Console
Vessel Counter
Lavatory

Size: 600 x 480 x 150 mm



LW 814 CJ

LE MUSE
Console
Vessel Counter
Lavatory

Size: 750 x 480 x 150 mm



LW 815 CJ

LE MUSE
Corner
Wall Hung Lavatory

Size: 615 x 485 mm



LW 818 J

LE MUSE
Console
Vessel Counter
Lavatory

Size: 650 x 370 x 150 mm



LW 819 J

LE MUSE
Console
Vessel Counter
Lavatory

Size: 800 x 370 x 150 mm



LW 810 CJ

LE MUSE
Wall Hung Lavatory

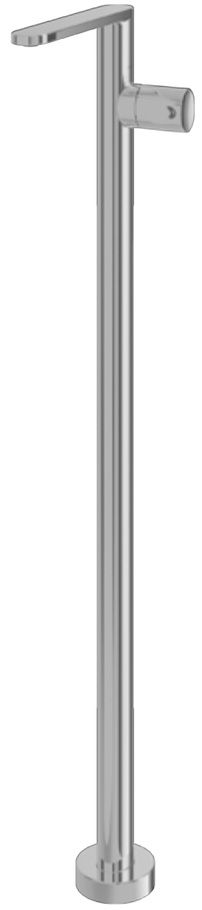
Size: 450 x 400 mm



LW 811 CJ

LE MUSE
Wall Hung Lavatory

Size: 550 x 480 mm



TX 128 LQBR

LE MUSE

Floor Standing Progressive
Lavatory Faucet



TX 115 LQBR

LE MUSE

Single Lever Lavatory Faucet
With 1" One Push Pop-Up Waste



TX 116 LQBR

LE MUSE

Extended Single Lever Lavatory
Faucet With 1" One Push
Pop-Up Waste
Height: 289 mm

Available:
TX 116 LQV4BR
Height: 245 mm



TX 303 BQBR

LE MUSE

Single Lever Bidet Faucet
With 1 1/4" Pop-Up Waste



TX 119 LQBR

LE MUSE

8" Lavatory Faucet
With 1" One Push Pop-Up Waste



TX 120 LQBR

LE MUSE

Progressive Wall Type
Lavatory Faucet



TX 442 SQBR

LE MUSE

Progressive Bath & Shower Mixer
With Diverter

38°C



TX 443 SQBR

LE MUSE

Progressive Shower Mixer



TX 441 SQ

LE MUSE

Bath Spout (PJ $^{1}/_{2}$")



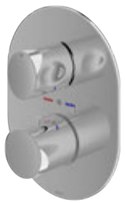
TX 447 SQBR

LE MUSE 4 Holes Bath & Shower Set



TX 467 SQBR

LE MUSE Bath Filler & Mixer

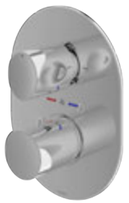


TX 451 SQBR

LE MUSE

Thermostat Bath or Shower Mixer
With Stop Valve

38°C



TX 473 SQBR

LE MUSE

Thermostat Shower Mixer
With Diverter & Stop Valve

38°C



TX 469 SQBR

LE MUSE

Mixing Valve For Bath & Shower
With Diverter



TX 468 SQBR

LE MUSE Mixing Valve For Shower



TX 468 SBQBR

LE MUSE Mixing Valve For Bath & Shower



TX 488 SQN

LE MUSE

Fixed Shower Head
L: 400 mm
Size: 220 x 340 mm (Oval Shape)



TX 491 SQN

LE MUSE

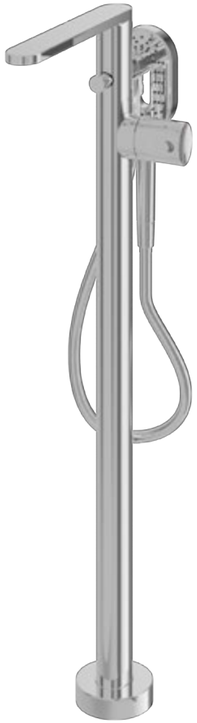
Fixed Shower Head
L: 190 mm
Size: 220 x 340 mm (Oval Shape)



TX 472 SQN

LE MUSE

Hand Shower With Wall Outlet



TX 494 SQBR

LE MUSE

Floor Standing Progressive
Bath & Shower Set



TX 484 SQ

LE MUSE

3 Way Diverter (1 in 3 out)

Available:
TX 453 SQ
2 Way Diverter (1 in 2 out)



TX 452 SQ

LE MUSE

Stop Valve

TOJA

ALVIN TJITROWIRJO



Graduated from RMIT University in Melbourne, Australia, Alvin's passion for art and design is complemented by his love for Indonesia, which is evident in his choice of materials and consistent involvement in the preservation of local heritage. Following an internship with world-renowned industrial designer Marcel Wanders, Alvin started his design studio, alvinT in 2007. His designs have been exhibited at the Salone Satelitte in Milan, Melbourne Design EX and Ambiente's Talents in Frankfurt among others.

Alvin designs the TOJA series, which is characterized by its bold rectangular shape.







CW 950 PJ

TOJA
One Piece Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)

Available:
(S-Trap Installation)



CW 951 J

TOJA
Wall Hung
Single Bowl Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 210 mm



LW 950 CJ

TOJA
Console
Vessel Counter
Lavatory

Size: 505 x 455 mm

Available:
LW 950 J (3 Tap Hole)



LW 951 CJ

TOJA
Console
Vessel Counter
Lavatory

Size: 605 x 455 mm

Available:
LW 951 J (3 Tap Hole)



LW 952 J

TOJA
Console
Vessel Counter
Lavatory

Size: 570 x 355 mm



LW 953 J

TOJA
Console
Vessel Counter
Lavatory

Size: 705 x 355 mm



LW 954 CJL

TOJA
Wall Hung Lavatory

Size: 900 x 460 mm



LW 954 CJR

TOJA
Wall Hung Lavatory

Size: 900 x 460 mm



TX 115 LT

TOJA — Single Lever Lavatory Faucet
With 1 1/4" Pop-Up Waste



TX 119 LT

TOJA — 8" Lavatory Faucet
With 1 1/4" Pop-Up Waste



TX 467 ST

TOJA — Bath Filler & Mixer



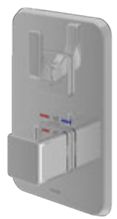
TX 116 LT

TOJA — Extended Single Lever Lavatory
Faucet With 1" Pop-Up Waste
Height: 294 mm



TX 447 ST

TOJA — 4 Holes Bath & Shower Set



TX 451 ST

TOJA

Thermostat Bath or Shower Mixer
With Stop Valve



TX 473 ST

TOJA

Thermostat Bath & Shower Mixer
With Diverter & Stop Valve

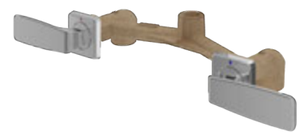


TX 484 ST

TOJA

3 Way Diverter (1 in 3 out)

Available:
TX 453 ST
2 Way Diverter (1 in 2 out)



TX 468 ST

TOJA Mixing Valve For Shower



TX 469 ST

TOJA Mixing Valve For Bath & Shower
With Diverter



TX 442 ST

TOJA

Single Lever Bath & Shower Mixer
With Diverter



TX 443 ST

TOJA

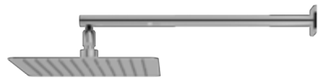
Single Lever Shower Mixer



TX 452 ST

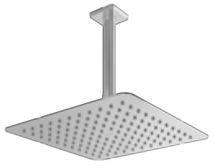
TOJA

Stop Valve



TX 488 ST

TOJA L: 400 mm
Fixed Shower Head Size: 250 x 250 mm
With Air Drop



TX 491 ST

TOJA L: 199 mm
Fixed Shower Head Size: 250 x 250 mm
With Air Drop
(Ceiling Type)



TX 471 ST

TOJA — Single Lever Bath & Shower Set



TX 474 ST

TOJA — Single Lever Shower Set



TX 492 ST

TOJA — Shower Column Set

LOOP

LEONARD THEOSABRATA



Graduated from the Art Center College of Design, Pasadena, CA, Leonard is currently the head of the Jakarta-based LTD, the Leonard Theosabrata Design studio. His award-winning furniture company, Accupuncto has won several notable accolades including the Red Dot Design Award in 2003, the Good Design Award Japan in 2005 and the Wallpaper Design Award in 2009.

Leonard designs the LOOP series, which is characterized by its graceful amorphous shape.







TX 115 LL

LOOP

Single Lever Lavatory Faucet
With 1" One Push Pop-Up Waste



TX 116 LL

LOOP

Extended Single Lever Lavatory
Faucet With 1" One Push
Pop-Up Waste
Height: 322 mm



TX 303 BL

LOOP

Single Lever Bidet Faucet
With 1¼" One Push Pop-Up Waste



TX 119 LL

LOOP

8" Lavatory Faucet
With 1" One Push Pop-Up Waste



TX 467 SL

LOOP — Bath Filler & Mixer



TX 447 SLN

LOOP — 4 Holes Bath & Shower Set



TX 468 SL

LOOP — Mixing Valve For Shower



TX 468 SBL

LOOP — Mixing Valve For Bath & Shower



TX 451 SLBR

LOOP — Thermostat Bath or Shower Mixer With Stop Valve

38°C



TX 473 SLBR

LOOP — Thermostat Bath & Shower Mixer With Diverter & Stop Valve

Available:
TX 473 SLV1BR
For Fixed Shower Head & Hand Shower

38°C



TX 469 SL

LOOP — Mixing Valve For Bath & Shower With Diverter



TX 452 SL

LOOP — Stop Valve



TX 484 SL

LOOP

3 Way Diverter (1 in 3 out)

Available:
TX 453 SL
2 Way Diverter (1 in 2 out)



TX 465 SL

LOOP

Fixed Shower Head (3S Soft)
L: 189 mm
Size: 120 mm diameter



TX 488 SLZ

LOOP

Fixed Shower Head
L: 400 mm
Size: 250 mm diameter



TX 491 SLZ

LOOP

Fixed Shower Head (Ceiling Type)
L: 194 mm
Size: 250 mm diameter



TX 471 SLN

LOOP

Bath & Shower Set With Progressive Mixer

38°C



TX 474 SLN

LOOP

Shower Set With Progressive Mixer



TX 472 SLN

LOOP

Hand Shower With Wall Outlet

SANITARY WARES
& BATHTUB

TOILET





CW 840 J

One Piece Toilet

4.5/3 L Dual Flush

Bowl Shape: Elongated
Rough-In: 305 mm



C 436 N

SUPERIOR
One Piece Toilet

13 L Siphon-Vortex Flush

Min. Water Pressure: 0.70 kgf/cm²
Bowl Shape: Elongated
Rough-In: 305 mm



CW 823 J

AVANTE
One Piece Toilet

6 L Tornado-II Siphonic Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 305 mm

Available:
CW 823 NJ (Dual Flush)

CW 823 PJ
Rough-In: 180 mm (P-Trap)



CW 825 J

VISION
One Piece Toilet

J - MAX 6 L System
Tornado-II Siphonic Flush
Rapid Flushing
Solid Duroplast Seat & Cover

Min. Water Pressure: 0.85 kgf/cm²
Bowl Shape: Elongated
Rough-In: 305 mm



CW 914 J

One Piece Toilet

G - MAX 6 L System
Siphon-Jet Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 305 mm



CW 630 J

One Piece Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm

Available:
CW 630 PJ
Rough-In: 180 mm (P-Trap)



CW 895 J

OMNI+
One Piece Toilet

4.5/3 L Dual Flush
Rough-In: 305 mm



CW 867 NJ

OMNI
One Piece Toilet

6/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 305 mm



CW 868 NJ

OMNI
One Piece Toilet

6/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm

Available:
CW 868 NPJ
Rough-In: 180 mm (P-Trap)



CW 631 J / SW 631 JP

Dual Flush
Close Coupled Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm

Available:
CW 631 PJ / SW 631 JP
Rough-In: 180 mm (P-Trap)



CW 896 J / SW 896 JP

OMNI+
Dual Flush
Close Coupled Toilet

4.5/3 L Dual Flush
Rough-In: 305 mm



CW 960 J / SW 960 JP

Dual Flush
Close Coupled Toilet

4.5/3 L Dual Flush
Rough-In: 305 mm



CW 821 J / SW 821 JP

AVANTE
Dual Flush
Close Coupled Toilet

6/3 L Tornado-II Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm

Available:
CW 821 PJ / SW 821 JP
Rough-In: 180 mm (P-Trap)



CW 826 J / SW 826 JP

VISION
Dual Flush
Close Coupled Toilet

6/3 L Tornado-II Siphonic
Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 305 mm



CW 860 NJ / SW 861 JP

OMNI
Dual Flush
Close Coupled Toilet

6/3 L Dual Flush

Bowl Shape: European Std.
Rough-In: 305 mm



CW 862 NJ / SW 862 JP

OMNI
Dual Flush
Close Coupled Toilet

6/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 230 mm

Available:
CW 862 NPJ / SW 862 JP
Rough-In: 180 mm (P-Trap)



CW 421 J / SW 420 JP

Dual Flush
Close Coupled Toilet

4.5/3 L Dual Flush

Bowl Shape: Round
Rough-In: 500 mm



CW 632 PJ / SW 632 JP

Dual Flush
Close Coupled Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)

Available:
(S-Trap Installation)



CW 637 J / SW 637 JP

Dual Flush
Close Coupled Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 220 mm



CW 660 NJ / SW 660 J

EURO
Dual Flush
Close Coupled Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: Round
Rough-In: 230 mm



CW 660 NPJ / SW 660 J

EURO
Dual Flush
Close Coupled Toilet

4.5/3 L Dual Flush

Bowl Shape: Round
Rough-In: 180 mm (P-Trap)



CW 635 PJ / SW 635 JP1

Dual Flush
Close Coupled Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm

Available:
(S-Trap Installation)



CW 635 PJ / SW 635 JP2

Dual Flush
Close Coupled Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm

Available:
(S-Trap Installation)



CW 668 J / SW 668 J

MEMORY
6 Liters
Close Coupled Toilet

6 L Single Flush

Bowl Shape: Elongated
Rough-In: 230 mm

Available:
CW 668 J / SW 668 JP
(Dual Flush)



CW 668 PJ / SW 668 J

MEMORY
6 Liters
Close Coupled Toilet

6 L Single Flush

Bowl Shape: Elongated
Rough-In: 180 mm (P-Trap)

Available:
CW 668 PJ / SW 668 JP
(Dual Flush)



CW 702 J / SW 784 JP

6 Liters
Close Coupled
Siphonic Toilet

6 L Siphonic Flush

Rough-In: 305 mm



C 704 L / SW 784 JP

6 Liters
Close Coupled
Siphonic Toilet

For The Disabled
6 L Siphonic Flush

Bowl Height: 441 mm
Rough-In: 305 mm



CW 705

Single Bowl Toilet

6 L Siphon Jet Flush
Inlet: Top

Min. Water Pressure: 0.70 kgf/cm²
Bowl Shape: Elongated
Rough-In: 280 mm



CW 705 L

Single Bowl Toilet

For The Disabled
6 L Siphon Jet Flush
Inlet: Top

Min. Water Pressure: 0.70 kgf/cm²
Bowl Height: 445 mm
Bowl Shape: Elongated
Rough-In: 280 mm



C 51

Single Bowl Toilet

6 L Single Flush
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Bowl Shape: Round
Rough-In: 577 mm



CW 425 J

Single Bowl Toilet

Children Toilet
6 L Single Flush
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Bowl Height: 245 mm
Rough-In: 470 mm



CW 800 J

Wall Hung
Single Bowl Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 210 mm (P-Trap)





CW 824 PJ

AVANTE
Wall Faced
Single Bowl Toilet

6/3 L Tornado-II Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)





CW 822 NJ

AVANTE
Wall Hung
Single Bowl Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 220 mm (P-Trap)





CW 875 NJ

OMNI
Wall Hung
Single Bowl Toilet

4.5/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: European Std.
Rough-In: 210 mm (P-Trap)





CW 620 J

Wall Hung
Single Bowl Toilet

6/3 L Dual Flush
Solid Duroplast Seat & Cover

Bowl Shape: Elongated
Rough-In: 220 mm (P-Trap)





CW 822 NJ

AVANTE
Wall Hung
Single Bowl Toilet

4.5 L Single Flush
Solid Duroplast Seat & Cover
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Bowl Shape: Elongated
Rough-In: 220 mm (P-Trap)



CW 824 PJ

AVANTE
Wall Faced
Single Bowl Toilet

6 L Single Flush
Solid Duroplast Seat & Cover
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Bowl Shape: European Std.
Rough-In: 180 mm (P-Trap)



CE 9

Squatting Toilet

6 L Single Flush

Min. Water Pressure: 0.70 kgf/cm²
Rough-In: 582 mm

CW 10 J

Squatting Toilet



CW 875 NJ

OMNI
Wall Hung
Single Bowl Toilet

4.5 L Single Flush
Solid Duroplast Seat & Cover
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Bowl Shape: European Std.
Rough-In: 210 mm (P-Trap)



CW 620 J

Wall Hung
Single Bowl Toilet

6 L Single Flush
Solid Duroplast Seat & Cover
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Bowl Shape: Elongated
Rough-In: 220 mm (P-Trap)

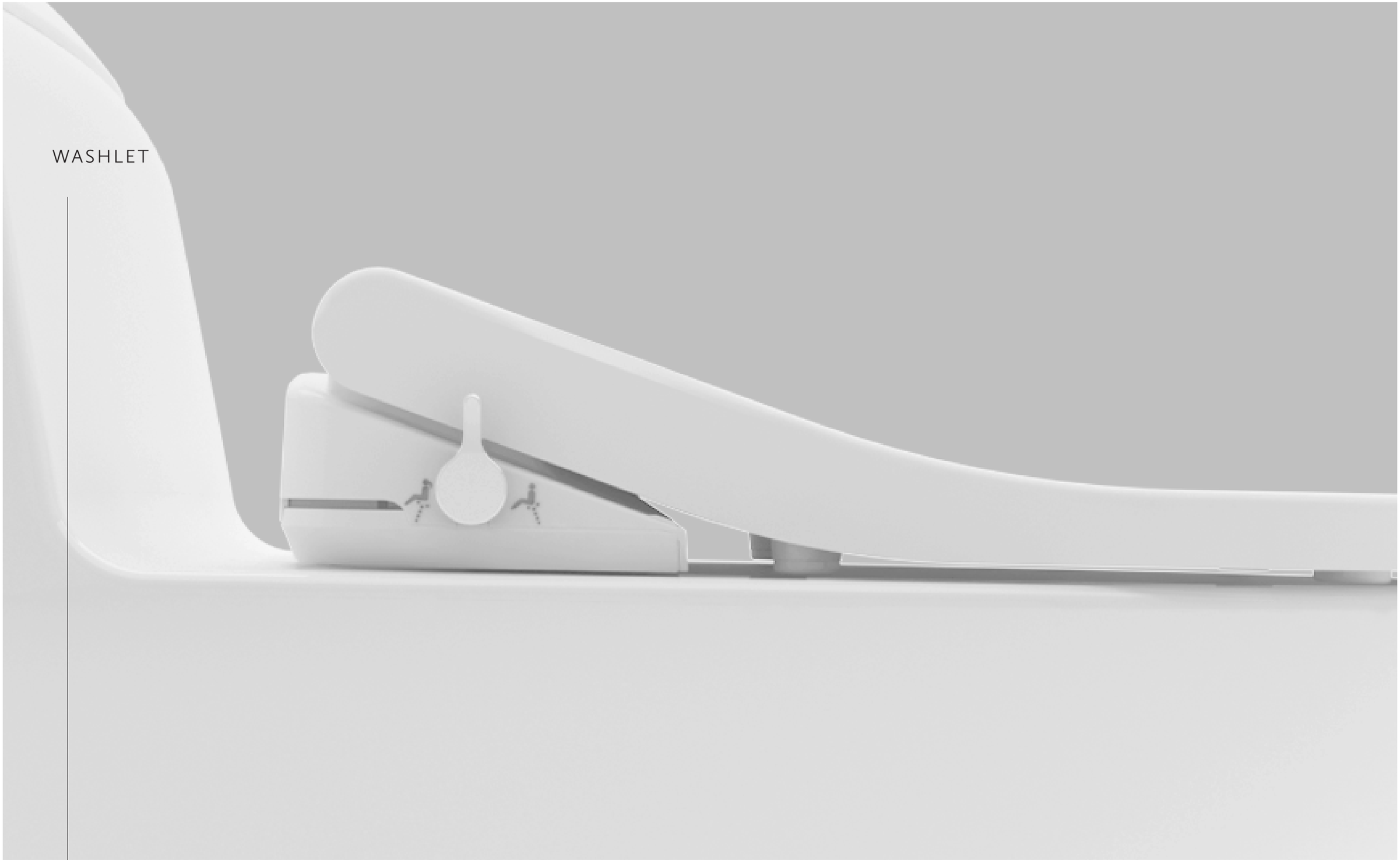
CE 6

Squatting Toilet

CE 7

Squatting Toilet

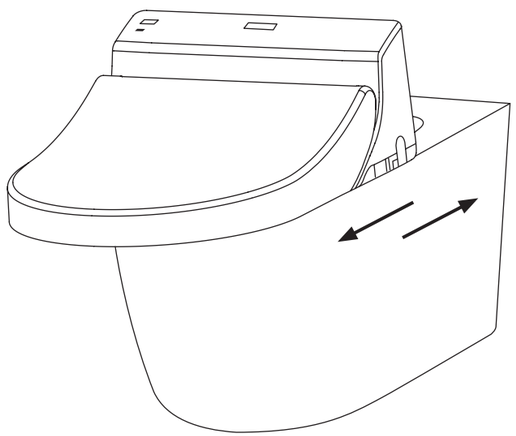
WASHLET



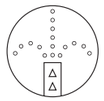
Since its invention in 1980, the WASHLET has singlehandedly revolutionized global hygiene standards. It is an electric seat with an integrated nozzle that uses warm water for personal cleansing. The WASHLET is incredibly versatile, not to mention simple and easy to use. It accommodates most TOTO toilets for perfect integration and its self-cleansing features ensure easy maintenance. More than just a technological feat, the WASHLET delivers inimitable comfort for the ultimate bathroom experience.

EASY REMOVAL

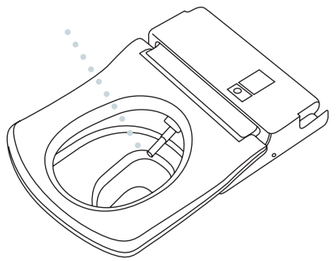
The incredibly versatile WASHLET seat cover can be easily removed and re-attached to ensure easy cleaning.



CUSTOM CLEANSE



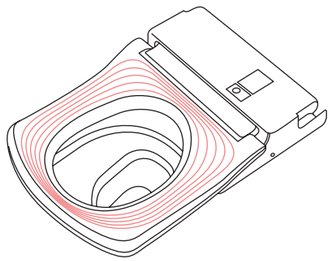
The WASHLET wand sprays streams of water with varying pressure and motions to accommodate your individual preference.



HEATED SEAT



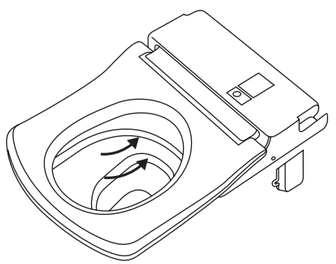
Adjustable temperature setting to ensure individual comfort.



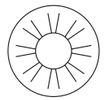
DEODORIZER



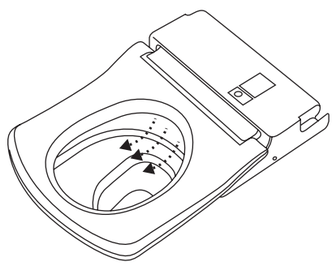
Air purifying technology to maintain a fresh and sanitary environment.



DRYER



Innovative drying feature to sustain hygienic, hands-free use.





TCW 07 S

Eco-Washer



TCW 08 S

Eco-Washer
* Bidet Function



TCW 09 S

Duroplast Eco-Washer
* Bidet Function



TCW 10 S

Duroplast Eco-Washer
* Bidet Function



TCW 03 SL

Eco-Washer

Available:
TCW 03 S (Short Elbow)



TCW 04 SL

Eco-Washer
* Bidet Function

Available:
TCW 04 S (Short Elbow)



TCW 05 SL

Eco-Washer (Round)

Available:
TCW 05 S (Short Elbow)



TCW 06 SL

Eco-Washer
* Bidet Function (Round)

Available:
TCW 06 S (Short Elbow)



TCF 490 AM2

WASHLET	Washlet (Round) 220 Volt / 410 W
	Available: TCF 491 AM2 (Elongated)



TCF 4731 A

WASHLET	Washlet (Elongated) 220 Volt / 830 W
	Available: TCF 4732 A (D-Shape)



TCF 6411 A

WASHLET	Washlet (Elongated / Regular Adjustable) 304 Volt / 410 W



TCW 1211 A

WASHLET	Washlet (Elongated) * Bidet Function

LAVATORY





L 710 CET

Console
Vessel Counter
Lavatory

Size: 500 x 450 x 135 mm



LW 542 J

Console
Vessel Counter
Lavatory

Size: 650 x 450 x 120 mm



LW 648 CJ

Console
Vessel Counter
Lavatory

Size: 795 x 495 x 115 mm

Available:
LW 648 J (3 Tap Holes)



LW 649 CJ

Console
Vessel Counter
Lavatory

Size: 550 x 440 x 85 mm

Available:
LW 649 J (3 Tap Holes)



LW 645 JN

Console
Vessel Counter
Lavatory

Size: 660 x 420 x 75 mm



LW 340 CJ

Console
Vessel Counter
Lavatory

Size: 750 x 500 x 120 mm

Available:
LW 340 J (3 Tap Holes)



LW 630 J

Console
Vessel Counter
Lavatory

Size: 600 x 370 x 110 mm



LW 631 J

Console
Vessel Counter
Lavatory

Size: 710 x 410 x 125 mm



LW 643 J

Console
Vessel Counter
Lavatory

Size: 584 x 384 x 100 mm



LW 640 NJ

Console
Vessel Counter
Lavatory

Size: 505 x 505 x 155 mm

Available:
LW 640 NCJ (1 Tap Hole)

Available:
Wall Hung Lavatory



L 652 D

Console
Vessel Counter
Lavatory

Size: 350 mm diameter
Height: 90 mm



LW 532 J

Console
Vessel Counter
Lavatory

Size: 450 mm diameter
Height: 100 mm



LW 536 CJ

Console
Vessel Counter
Lavatory

Size: 454 mm diameter
Height: 100 mm



LW 535 J

Console
Vessel Counter
Lavatory

Size: 500 mm diameter
Height: 120 mm



LW 537 CJ

Console
Vessel Counter
Lavatory

Size: 484 mm diameter
Height: 100 mm



LW 572 J

Console
Vessel Counter
Lavatory

Size: 400 mm diameter
Height: 125 mm



LW 573 J

Console
Vessel Counter
Lavatory

Size: 420 mm diameter
Height: 125 mm



LW 896 J

OMNI+
Console
Vessel Counter
Lavatory

Size: 620 x 430 x 130 mm



LW 574 J

Console
Vessel Counter
Lavatory

Size: 420 x 420 x 125 mm



LW 523 NJ

Console
Vessel Counter
Lavatory

Size: 430 mm diameter
Height: 160 mm



LW 893 CJ

OMNI+
Console
Vessel Counter
Lavatory

Size: 430 mm diameter
Height: 130 mm



LW 895 J

OMNI+
Console
Vessel Counter
Lavatory

Size: 430 mm diameter
Height: 130 mm



LW 533 J

Semi Recessed Lavatory

Size: 430 mm diameter



LW 642 CJ

Semi Recessed Lavatory

Size: 415 x 485 mm
Height: 127 mm

Available:
LW 642 J (3 Tap Holes)



LW 526 NJ

Semi Recessed Lavatory

Size: 430 mm diameter
Height: 75 mm



LW 528 NJ

Semi Recessed Lavatory

Size: 440 mm diameter
Height: 75 mm



LW 646 J

Semi Recessed Lavatory

Size: 600 x 400 mm



LW 647 CJ

Semi Recessed Lavatory

Size: 520 x 420 x 87 mm

Available:
LW 647 J (3 Tap Holes)



LW 641 NJ

Semi Recessed
Lavatory

Size: 505 x 505 x 115 mm

Available:
LW 641 NCJ (1 Tap Hole)



LW 824 CJ

Semi Recessed
Lavatory

Size: 550 x 460 mm

Available:
LW 824 J (3 Tap Holes)



LW 830 J

Semi Recessed
Lavatory

Size: 500 x 550 mm

Available:
LW 830 CJ (1 Tap Hole)



LW 660 CJ

Semi Recessed
Lavatory

Size: 550 x 460 mm

LW 661 CJ
Size: 470 x 420 mm

Available:
LW 660 J (3 Tap Holes)
Size: 550 x 460 mm

LW 661 J (3 Tap Holes)
Size: 470 x 420 mm



LW 829 CJ

VISION
Semi Recessed
Lavatory

Size: 580 x 480 mm

Available:
LW 829 J (3 Tap Holes)



L 521 V1A

Self Rimming
Lavatory

Size: 540 x 490 mm

Available:
L 521 V3 (1 Tap Hole)



LW 565

Self Rimming
Lavatory

Size: 445 x 366 mm



LW 648 CJT1

Self Rimming
Lavatory

Size: 795 x 495 mm

Available:
LW 648 JT1 (3 Tap Holes)



L 568 V3

Self Rimming
Lavatory

Size: 486 x 409 mm



LW 530 J

Self Rimming
Lavatory

Size: 450 mm diameter



LW 781 J

Self Rimming
Lavatory

Size: 635 x 462 mm

Available:
LW 781 CJ (1 Tap Hole)



LW 538 RCB

Self Rimming
Lavatory

Size: 482 x 482 mm



LW 861 CJ

OMNI
Self Rimming
Lavatory

Size: 550 x 446 mm



LW 587 J

Under
Counter Lavatory

Size: 457 x 355 mm (Opening)



LW 899 J

OMNI+
Self Rimming
Lavatory

Size: 595 x 485 x 170 mm

Available:
LW 899 CJ (1 Tap Hole)



L 546

Under
Counter Lavatory

Size: 480 x 330 mm (Opening)



L 548

Under
Counter Lavatory

Size: 530 x 350 mm (Opening)



LW 651 J

Under Counter Lavatory

Size: 500 x 350 mm (Opening)



LW 540 J

Under Counter Lavatory

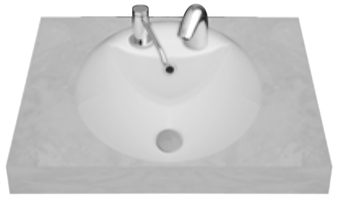
Size: 520 x 345 mm (Opening)



LW 549 J

Under Counter Lavatory

Size: 630 x 345 mm (Opening)



LW 539 JT1

Under Counter Lavatory

Size: 480 x 410 mm (Opening)

Available:
LW 539 CJ (1 Tap Hole)



LW 592 J

Under Counter Lavatory

Size: 450 x 295 mm (Opening)



LW 595 J

Under Counter Lavatory

Size: 615 x 295 mm (Opening)



LW 242 J / LW 239 FJ

Pedestal Lavatory

Size: 660 x 545 mm

Available:
LW 242 CJ (1 Tap Hole)



LW 860 CJ / LW 860 FJ

OMNI
Pedestal Lavatory

Size: 600 x 500 mm

Available:
LW 860 J (3 Tap Holes)



LW 236 CJ / LW 239 FJ

Pedestal Lavatory

Size: 530 x 465 mm



LW 241 CJ / LW 239 FJ

Pedestal Lavatory

Size: 580 x 500 mm

Available:
LW 241 J (3 Tap Holes)



LW 820 J / LW 820 FJ

AVANTE
Pedestal Lavatory

Size: 700 x 550 mm

LW 827 J / LW 825 FJ
Size: 550 x 460 mm

Available:
LW 820 CJ (1 Tap Hole)
Size: 700 x 550 mm

LW 827 CJ (1 Tap Hole)
Size: 550 x 460 mm



LW 825 J / LW 825 FJ

VISION
Pedestal Lavatory

Size: 700 x 550 mm

LW 828 J / LW 825 FJ
Size: 580 x 480 mm

Available:
LW 825 CJ (1 Tap Hole)
Size: 700 x 550 mm

LW 828 CJ (1 Tap Hole)
Size: 580 x 480 mm



LW 780 J / LW 780 FJ

Pedestal Lavatory

Size: 686 x 500 mm

Available:
LW 780 CJ (1 Tap Hole)



LW 668 J / LW 668 FJ

MEMORY
Pedestal Lavatory

Size: 700 x 565 mm

Available:
LW 668 CJ (1 Tap Hole)



LW 242 J / LW 242 HFJ

Half Pedestal
Lavatory

Size: 660 x 545 mm

Available:
LW 242 CJ (1 Tap Hole)



LW 860 CJ / LW 860 HFJ

OMNI
Half Pedestal
Lavatory

Size: 600 x 500 mm

Available:
LW 860 J (3 Tap Holes)



LW 820 J / LW 820 HFJ

AVANTE
Half Pedestal
Lavatory

Size: 700 x 550 mm

Available:
LW 820 CJ (1 Tap Hole)



LW 825 J / LW 825 HFJ

VISION
Half Pedestal
Lavatory

Size: 700 x 550 mm

Available:
LW 825 CJ (1 Tap Hole)

Available:
LW 828 CJ / LW 825 HFJ
Size: 580 x 480 mm



LW 240 CJ / LW 240 HFJ

Half Pedestal
Lavatory

Size: 500 x 350 mm



LW 241 CJ / LW 242 HFJ

Half Pedestal
Lavatory

Size: 580 x 500 mm

Available:
LW 241 J (3 Tap Holes)



LW 575 JR

Wall Hung Lavatory

Size: 400 x 465 mm



L 650 D

Wall Hung Lavatory

Size: 750 x 300 mm



LW 103 JT1

Wall Hung Lavatory

For The Disabled
Size: 580 x 550 mm



LW 230 J

Wall Hung Lavatory

Size: 500 x 400 mm



LW 897 J

OMNI+
Wall Hung Lavatory

Size: 455 x 430 x 180 mm

Available:
LW 897 CJ (1 Tap Hole)



LW 898 J

OMNI+
Wall Hung Lavatory

Size: 450 x 430 x 320 mm

Available:
LW 898 CJ (1 Tap Hole)



L 38 V1

Wall Hung Lavatory

Size: 500 x 330 mm



L 529 V1

Wall Hung Lavatory

Size: 430 x 435 mm

Available:
L 529 V3 (1 Tap Hole)



LW 7 CJ

Corner
Wall Hung Lavatory

Size: 660 x 475 mm



LW 240 CJ

Wall Hung Lavatory

Size: 500 x 350 mm



LW 248 JT1

Wall Hung Lavatory

Size: 510 x 260 mm

Available 35 mm hole:
LW 248 JL (Left Tap Hole)
LW 248 JR (Right Tap Hole)



LW 246 J

Wall Hung Lavatory

Size: 450 x 305 mm



LW 247 CJ

Wall Hung Lavatory

Size: 500 x 430 mm



LW 211 CJ

Wall Hung Lavatory

Size: 500 x 400 mm



LW 236 CJ

Wall Hung Lavatory

Size: 530 x 465 mm

Available:
LW 236 JT3 (2 Tap Holes)

URINAL





USWN 870 RB

Urinal

Built-In Sensor System
Fuzzy Logic Control Software
Spreader Warning
Battery Operated
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Size: 400 x 365 x 836 mm

AUTO



UW 350 HJT1

Urinal

Sensor System
Fuzzy Logic Control Software
Battery Operated
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Size: 370 x 360 x 740 mm

Available:
UW 350 HJT1M (Moslem Type)

AUTO



UW 811 HJ

LE MUSE
Urinal

Sensor System
Fuzzy Logic Control Software
Battery Operated
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm²
Size: 325 x 340 x 560 mm

AUTO



UW 447 HJT1

Urinal

Sensor System
Fuzzy Logic Control Software
Battery Operated
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm^2
Size: 444 x 356 x 685 mm

Available:
UW 447 HJNM (Moslem Type)

AUTO



U 57 K

Urinal

Sensor System
Fuzzy Logic Control Software
Battery Operated
Inlet: Back

Min. Water Pressure: 0.70 kgf/cm^2
Size: 330 x 310 x 737 mm

AUTO



UW 447 JT1

Urinal

Size: 444 x 356 x 685 mm



UW 447 JNM

Urinal

Moslem Type
Size: 444 x 356 x 685 mm



UW 930 J

Urinal

Size: 420 x 362 x 744 mm



UW 930 HJ

Urinal

Size: 420 x 362 x 744 mm

Available:
UW 930 HJM (Moslem Type)



U 370 M

Urinal	Moslem Type Size: 460 x 360 x 820 mm



U 370

Urinal	Size: 460 x 360 x 820 mm



U 104

Urinal	Size: 320 x 340 x 540 mm



U 57 M

Urinal	Moslem Type Size: 330 x 310 x 605 mm



U 57

Urinal	Size: 330 x 310 x 605 mm



AW 115 J

Urinal Partition	Size: 100 x 350 x 760 mm



A 100

Urinal Partition	Size: 100 x 350 x 760 mm

BIDET





BW 827 J

VISION
Wall Faced
Bidet

Available:
BW 827 JT1 (3 Tap Holes)



BW 630 J

Wall Faced
Bidet



BW 668 J

MEMORY
Wall Faced
Bidet



BW 823 J

AVANTE
Wall Faced
Bidet



BW 824 J

AVANTE
Wall Faced
Bidet



BW 860 J

OMNI
Wall Faced
Bidet



BW 914 J

Wall Faced
Bidet



BW 800 J

Wall Hung
Bidet



BW 875 J

OMNI
Wall Hung
Bidet



BW 822 NJT1

AVANTE
Wall Hung
Bidet



BW 620 J

Wall Hung
Bidet

BATHTUBS





FBYN 1826 CPWE

Free Standing
Enameled Cast Iron
Bathtub Without
Hand Grips

Anti Slip
Size: 1800 x 800 x 575 mm
Capacity: 220 liters

Pop-Up Waste: Included



FBYN 1810 CHPE

Enameled Cast Iron
Bathtub With
Hand Grips

Anti Slip
Size: 1800 x 800 x 470 mm
Capacity: 172 liters

Pop-Up Waste: 9008LN (Optional)

Available:
FBYN 1810 CPE
Enameled Cast Iron Bathtub
Without Hand Grips



FBY 1860 HPWE

Enameled Cast Iron
Bathtub With
Hand Grips

Anti Slip
Size: 1800 x 900 x 540 mm
Capacity: 226 liters

Pop-Up Waste: Included
Accessories: DB210C (Optional)



FBY 1760 CHPE

Enameled Cast Iron
Bathtub With
Hand Grips

Anti Slip
Size: 1720 x 900 x 530 mm
Capacity: 245 liters

Pop-Up Waste: 9008LN (Optional)



FBYN 1710 CPE

Enameled Cast Iron
Bathtub Without
Hand Grips

Anti Slip
Size: 1700 x 750 x 470 mm
Capacity: 187 liters

Pop-Up Waste: 9008LN (Optional)



FBY 1750 PV22E

Enameled Cast Iron
Bathtub Without
Hand Grips

Anti Slip
Size: 1700 x 850 x 480 mm
Capacity: 258 liters

Pop-Up Waste: 9008LN (Optional)



FBYN 1710 NPE

Enameled Cast Iron
Bathtub Without
Hand Grips

Anti Slip
Size: 1700 x 750 x 470 mm
Capacity: 187 liters

Pop-Up Waste: 9008LN (Optional)



FBYN 1700 PE

Enameled Cast Iron
Bathtub Without
Hand Grips

Anti Slip
Size: 1700 x 750 x 500 mm
Capacity: 187 liters

Pop-Up Waste: 9008LN (Optional)



FBY 1520 PE

Enameled Cast Iron
Bathtub Without
Hand Grips

Anti Slip
Size: 1517 x 750 x 465 mm
Capacity: 195 liters

Pop-Up Waste: 9008LN (Optional)



PJY 1704 PWE

Reinforced Marble
Bathtub Without
Hand Grips

Size: 1700 x 800 x 585 mm
Capacity: 335 liters

Pop-Up Waste: Included

Available:
PJY 1704 HPWE
Reinforced Marble Bathtub
With Hand Grips



PJY 1804 PWE

Reinforced Marble
Bathtub Without
Hand Grips

Size: 1800 x 850 x 585 mm
Capacity: 400 liters

Pop-Up Waste: Included

Available:
PJY 1804 HPWE
Reinforced Marble Bathtub
With Hand Grips



PJY 1814 PWE

Reinforced Marble
Bathtub Without
Hand Grips

Size: 1800 x 900 x 665 mm
Capacity: 375 liters

Pop-Up Waste: Included

Available:
PJY 1814 HPWE
Reinforced Marble Bathtub
With Hand Grips



PPY 1530 WV1

Pearl Bathtub
Without Hand Grips

Anti Slip
Size: 1500 x 1500 x 660 mm
Capacity: 276 liters

Pop-Up Waste Included:
DB501R-2B



PPY 1710 HPWE

Pearl Bathtub
Without Hand Grips

Size: 1700 x 800 x 595 mm
Capacity: 184 liters

Pop-Up Waste Included:
DB501R-2B



PPY 1610 HPWE

Pearl Bathtub
With Hand Grips

Anti Slip
Size: 1600 x 810 x 630 mm
Capacity: 179 liters

Pop-Up Waste Included:
DB501R-2B



PPY 1620 PWE

Pearl Bathtub
Without Hand Grips

Anti Slip
Size: 1600 x 1600 x 556 mm
Capacity: 272 liters

Pop-Up Waste Included:
DB501R-2B



PPY 1930 HPWE

Pearl Bathtub
With Hand Grips

Size: 1900 x 950 x 650 mm
Capacity: 276 liters

Pop-Up Waste Included:
DB501R-2B

Available:
PPY 1930 PWE
Pearl Bathtub Without Hand Grips



DUO COMFORT

Enameled
Pressed Steel
Bathtub

Size: 1800 x 800 x 420 mm
Capacity: 240 liters

Pop-Up Waste: 9008LN (Optional)



FB 1700 - 70

Enameled
Pressed Steel
Bathtub

Anti Slip
Size: 1700 x 700 x 390 mm
Capacity: 190 liters

Pop-Up Waste: 9005N (Optional)



FB 1700 - 75

Enameled
Pressed Steel
Bathtub

Anti Slip
Size: 1700 x 750 x 390 mm
Capacity: 180 liters

Pop-Up Waste: 9005N (Optional)



FB 1700 - 80N

Enameled
Pressed Steel
Bathtub

Anti Slip
Hand Grips
Size: 1700 x 800 x 410 mm
Capacity: 210 liters

Pop-Up Waste: 9005N (Optional)



SK 508

Laundry Sink

Size: 595 x 500 mm



SK 33

Service Sink

Size: 560 x 456 mm



SK 322 E

Slop Sink

Size: 508 x 660 mm

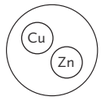
SANITARY FITTINGS

Details are not just details. They make the product. At TOTO, we are committed to creating superior products that enhance your life and ensure your safety. Our range of sanitary fittings is designed using the most advanced technology to protect you from environmental inconsistencies.





PURE BRASS ALLOY



All of our fittings are fashioned using pure brass. Strong and durable, this copper-zinc alloy also has antimicrobial properties and is resistant to corrosion.

DURABLE CHROME PLATING



All of out fittings are chrome plated to prevent rusting and ensure durability. At 0.5 micron (replace w/ symbol), our chrome plating is one of the thickest in the industry.

LEAD FREE TREATMENT



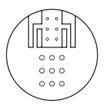
All of our fittings are put through a systematic de-leading treatment to eliminate the possibility of lead contamination. It removes 99.9% of lead from the surface, which would otherwise come into contact with water.

DURABLE CARTRIDGE



All of our cartridges are rigorously tested to ensure their durability. Each and every single one of them goes through at least 200,000 cycles before they're approved for distribution. The cartridges are crucial as they serve as a filter to distill sand and other potentially harmful impurities.

WATER SAVING AERATOR



Our aerator technology mixes air with water to reduce water consumption without compromising comfort. This means that you will still get to enjoy a full, pleasurably water jet and save on your water bill.

ELEMENTS OF STYLE

Our extensive collection of sanitary fittings ensures complete freedom of expression. Each series is designed to make an individual statement that is uniquely yours.

MODERN

214 Mono
224 Icon
232 Natura
238 Ego
250 Ego II
270 Ego III
274 Plano

CONTEMPORARY

280 Cocktail
286 Opus
294 Fiore
302 Rei
312 Jazz
316 Bella
320 Helio
324 Umi
328 Donna

CLASSIC

334 Gloria
344 Curio
354 Crown
360 Satin



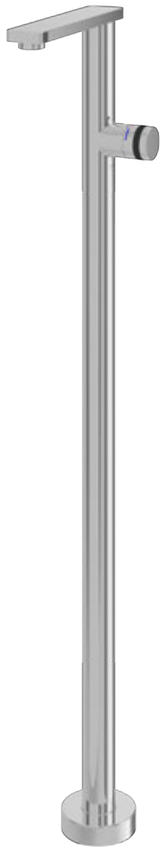
MODERN

The Modern collections are designed for those who appreciate the wealth of subtlety. Simple yet bold, they are meant to distinguish your home from the rest.



MONO





TX 128 LMBR

MONO

Floor Standing Lavatory Faucet
With Progressive Mixer



TX 115 LMBR

MONO

Lavatory Faucet With Progressive
Mixer and 1" One Push
Pop-Up Waste



TX 116 LMBR

MONO

Extended Lavatory Faucet With
Progressive Mixer and 1" One
Push Pop-Up Waste
Height: 253 mm



TX 119 LMBR

MONO

8" Lavatory Faucet
With 1" One Push Pop-Up Waste



TX 605 KMBR

MONO

Single Lever Kitchen Faucet



TX 303 BMBR

MONO

Bidet Faucet With Progressive Mixer and 1¹/₄" Pop-Up Waste



TX 451 SMBR

MONO

Thermostat Bath or Shower Mixer With Stop Valve

38°C



TX 473 SMBR

MONO

Thermostat Bath & Shower Mixer With Diverter & Stop Valve

Available:
TX 473 SMV1BR
For Fixed Shower Head & Hand Shower

38°C

TX 443 SMBR

MONO

Progressive Shower Mixer



TX 442 SMBR

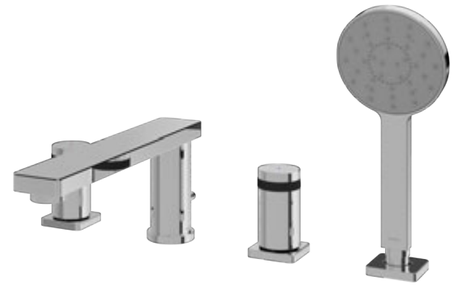
MONO

Progressive Bath & Shower Mixer With Diverter



TX 467 SMBR

MONO — Bath Filler & Mixer



TX 447 SMBR

MONO — 4 Holes Bath & Shower Set



TX 484 SM

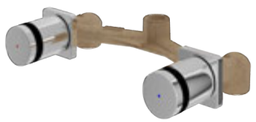
MONO — 3 Way Diverter (1 in 3 out)

Available:
TX 453 SM
2 Way Diverter (1 in 2 out)



TX 452 SM

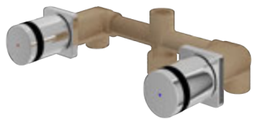
MONO — Stop Valve



TX 468 SMBR

MONO

Mixing Valve For Shower



TX 468 SBMBR

MONO

Mixing Valve For Bath & Shower



TX 469 SMBR

MONO

Mixing Valve For Bath & Shower
With Diverter



TX 441 SM

MONO

Bath Spout (PJ $^{1}/_{2}$")



TX 465 SM

MONO

Fixed Shower Head (3S Soft)
L: 178 mm
Size: 105 mm diameter



TX 475 SM

MONO

Fixed Shower Head (3S Soft)



TX 488 SMZ

MONO
Fixed Shower Head
With Air Drop

L: 400 mm
Size: 300 mm diameter



TX 491 SMZ

MONO
Fixed Shower Head
With Air Drop
(Ceiling Type)

L: 190 mm
Size: 300 mm diameter



TX 449 SMBR

MONO

Thermostat Bath & Shower Set

38°C



TX 450 SMN

MONO

Thermostat Shower Set

38°C



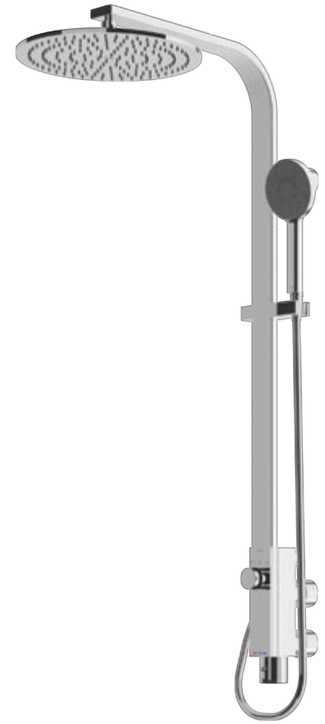
TX 494 SMBR

MONO — Floor Standing Bath & Shower Set With Progressive Mixer



TX 721 AM

MONO — Sliding Rail (900 mm)



TX 454 SMN

MONO — Thermostat Shower Column Set

38°C

ICON





TX 115 LI

ICON

Single Lever Lavatory Faucet
With 1¼" Pop-Up Waste



TX 108 LI

ICON

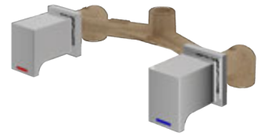
Single Lever Lavatory Faucet
With 1¼" Pop-Up Waste



TX 116 LI

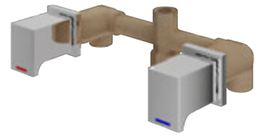
ICON

Extended Single Lever Lavatory
Faucet With 1" Pop-Up Waste
Height: 324 mm



TX 468 SI

ICON Mixing Valve For Shower



TX 468 SBI

ICON Mixing Valve For Bath & Shower



TX 301 BI

ICON

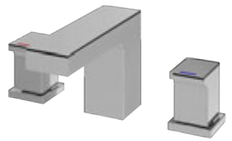
Single Lever Bidet Faucet
With 1¼" Pop-Up Waste



TX 303 BI

ICON

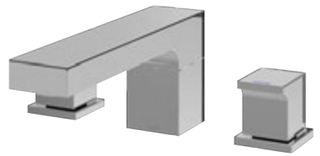
Single Lever Bidet Faucet
With 1¼" Pop-Up Waste



TX 119 LI

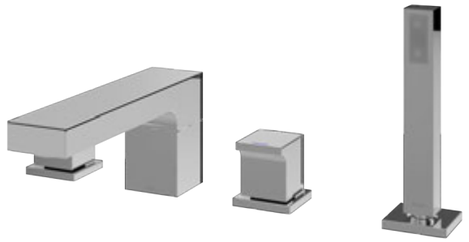
ICON

8" Lavatory Faucet
With 1¼" Pop-Up Waste



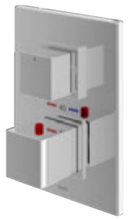
TX 467 SI

ICON Bath Filler & Mixer



TX 447 SI

ICON 4 Holes Bath & Shower Set



TX 451 SIBR

ICON

Thermostat Bath or Shower Mixer
With Stop Valve

38°C



TX 473 SIBR

ICON

Thermostat Bath & Shower Mixer
With Diverter & Stop Valve

Available:
TX 473 SIV1BR
For Fixed Shower Head & Hand Shower

38°C

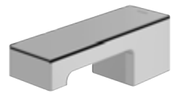


TX 484 SI

ICON

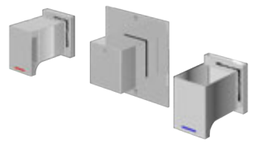
3 Way Diverter (1 in 3 out)

Available:
TX 453 SI
2 Way Diverter (1 in 2 out)



TX 441 SI

ICON	Bath Spout (PJ 3/4")



TX 469 SI

ICON	Mixing Valve for Bath & Shower With Diverter



TX 443 SI

ICON

Single Lever Shower Mixer



TX 442 SIN

ICON

Single Lever Bath & Shower Mixer
With Diverter



TX 452 SI

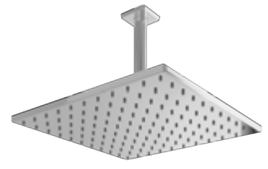
ICON

Stop Valve



TX 488 SIZ

ICON Fixed Shower Head	L: 400 mm Size: 300 x 300 mm



TX 491 SIZ

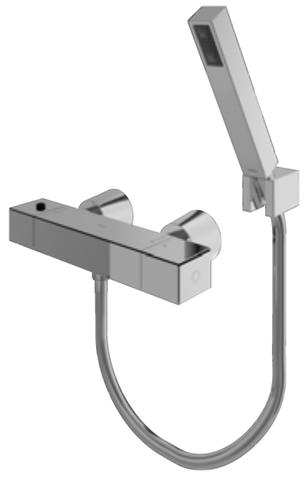
ICON Fixed Shower Head (Ceiling Type)	L: 186 mm Size: 300 x 300 mm



TX 449 SI

ICON — Thermostat Bath & Shower Set

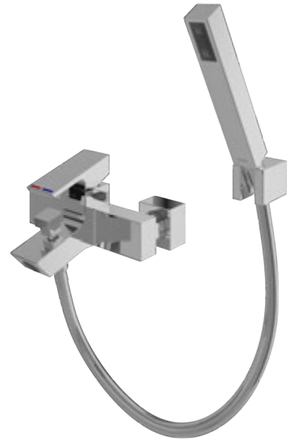
38°C



TX 450 SI

ICON — Thermostat Shower Set

38°C



TX 471 SI

ICON — Single Lever Bath & Shower Set

38°C



TX 474 SI

ICON — Single Lever Shower Set



TX 426 SI

ICON — Hand Shower Set With Wall Outlet

NATURA





TX 115 LNNBR

NATURA

Single Lever Lavatory Faucet
With 1" Pop-Up Waste



TX 116 LNNBR

NATURA

Extended Single Lever Lavatory
Faucet With 1" Pop-Up Waste
Height: 266 mm



TX 119 LNBR

NATURA

8" Lavatory Faucet
With 1" One Push Pop-Up Waste



TX 451 SNBR

NATURA

Thermostat Bath or Shower
Mixer With Stop Valve

38°C



TX 473 SNBR

NATURA

Thermostat Shower Mixer
With Diverter & Stop Valve

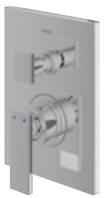
38°C



TX 303 BNBR

NATURA

Single Lever Bidet Faucet
With 1¹/₄" Pop-Up Waste



TX 442 SNBR

NATURA

Single Lever Bath & Shower Mixer
With Diverter



TX 443 SNBR

NATURA

Single Lever Shower Mixer



TX 467 SNBR

NATURA

Bath Filler & Mixer



TX 447 SNBR

NATURA

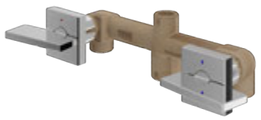
4 Holes Bath & Shower Set



TX 468 SNBR

NATURA

Mixing Valve For Shower



TX 468 SBNBR

NATURA

Mixing Valve For Bath & Shower



TX 469 SNBR

NATURA

Mixing Valve For Bath & Shower
With Diverter



TX 452 SN

NATURA

Stop Valve



TX 484 SN

NATURA

3 Way Diverter (1 in 3 out)

Available:
TX 453 SN
2 Way Diverter (1 in 2 out)



TX 474 SNBR

NATURA Single Lever Shower Set



TX 471 SNBR

NATURA Single Lever Bath & Shower Set



TX 450 SNBR

NATURA Thermostat Shower Set

38°C



TX 449 SNBR

NATURA Thermostat Bath & Shower Set

38°C

EGO





TX 115 LEBR

EGO

Single Lever Lavatory Faucet
With 1¹/₄" Pop-Up Waste



TX 116 LEBR

EGO

Extended Single Lever Lavatory
Faucet With 1" Pop-Up Waste
Height: 344 mm

Available:
TX 116 LEDBR
(With 1" Deluxe Pop-Up Waste)



TX 116 LEV4BR

EGO

Extended Single Lever Lavatory
Faucet With 1¹/₄" Pop-Up Waste
Height: 259 mm

Available:
TX 116 LEV4DBR
(With 1¹/₄" Deluxe Pop-Up Waste)



TX 108 LEBR

EGO

Single Lever Lavatory Faucet
With 1¹/₄" Pop-Up Waste



TX 303 BEBR

EGO

Single Lever Bidet Faucet
With 1¹/₄" Pop-Up Waste



TX 119 LEBR

EGO

8" Lavatory Faucet
With 1¹/₄" Pop-Up Waste



TX 304 BEBR

EGO

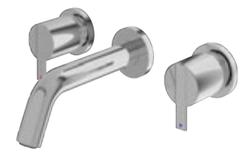
3 Holes Bidet Faucet
With 1¹/₄" Pop-Up Waste



TX 120 LEBR

EGO

Single Lever Wall Type
Lavatory Faucet



TX 118 LEBR

EGO

Combination Wall Type
Lavatory Faucet



TX 467 SEBR

EGO — Bath Filler & Mixer



TX 447 SEN

EGO — 4 Holes Bath & Shower Set



TX 471 SE

EGO — Single Lever Bath & Shower Set (3S Massage)



TX 474 SE

EGO — Single Lever Shower Set (3S Massage)



TX 446 SE

EGO — Combination Shower Set (3S Massage)



TX 445 SE

EGO — Combination Bath & Shower Set (3S Massage)



TX 449 SEN

EGO — Thermostat Bath & Shower Set (3S Massage)



TX 450 SE

EGO — Thermostat Shower Set (3S Massage)



TX 494 SEV2

EGO — Floor Standing Bath Filler With Towel Bar



TX 494 SEV3

EGO — Floor Standing Bath Filler



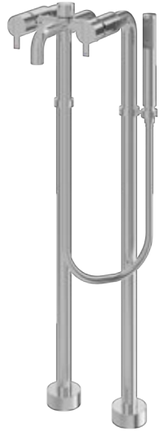
TX 472 SE

EGO — Hand Shower With Wall Outlet (3S Massage)



TX 721 AEZ

EGO — Sliding Rail (625 mm)



TX 445 SEMV3BR

EGO — Floor Standing Bath & Shower Set



TX 451 SEBR

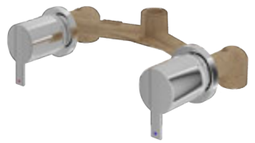
EGO — Thermostat Bath or Shower Mixer With Stop Valve



TX 473 SEBR

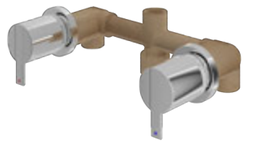
EGO — Thermostat Bath & Shower Mixer With Diverter & Stop Valve

Available:
TX 473 SEV1BR
For Fixed Shower Head & Hand Shower



TX 468 SEBR

EGO — Mixing Valve For Shower



TX 468 SBEBR

EGO — Mixing Valve For Bath & Shower



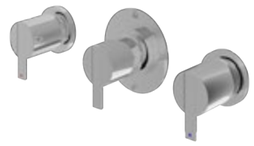
TX 443 SEBR

EGO — Single Lever Shower Mixer



TX 442 SEBR

EGO — Single Lever Bath & Shower Mixer With Diverter



TX 469 SEBR

EGO — Mixing Valve For Bath & Shower With Diverter



TX 441 SE

Bath Spout (PJ $^{1}/_{2}$")

Available:
TX 441 SEV1 (PJ $^{3}/_{4}$")



TX 470 SEN

Bath Spout With Diverter
For Hand Shower (PJ $^{1}/_{2}$")



TX 452 SE

EGO

Stop Valve



TX 438 SE

EGO
Fixed Shower Head

L: 194 mm
Size: 65 mm diameter



TX 438 SEM

EGO
Fixed Shower Head
(3S Massage)

L: 202 mm
Size: 65 mm diameter



TX 465 SEN

Fixed Shower Head
(3S Soft)
L: 189 mm
Size: 120 mm diameter



TX 475 SEZ

Fixed Shower Head
(Ceiling Type)
L: 164 mm
Size: 180 mm diameter



TX 484 SE

EGO

3 Way Diverter (1 in 3 out)

Available:
TX 453 SE
2 Way Diverter (1 in 2 out)



TX 721 AEV1

EGO

Sliding Rail With Elbow

EGO II





TX 115 LESBR

EGO-II

Single Lever Lavatory Faucet
With 1¼" Pop-Up Waste



TX 116 LESBR

EGO-II

Extended Single Lever Lavatory
Faucet With 1" Pop-Up Waste
Height: 340 mm

Available:
TX 116 LESDBR
(With 1" Deluxe Pop-Up Waste)



TX 116 LESV4BR

EGO-II

Extended Single Lever Lavatory
Faucet With 1¼" Pop-Up Waste
Height: 255 mm

Available:
TX 116 LESV4DBR
(With 1¼" Deluxe Pop-Up Waste)



TX 115 LELBR

EGO-II

Single Lever Lavatory Faucet
With 1¼" Pop-Up Waste



TX 118 LESBR

EGO-II

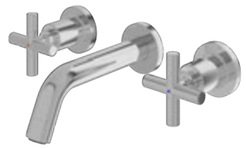
Combination Wall Type
Lavatory Faucet



TX 118 LEL

EGO-II

Lever Handle Combination
Wall Type Lavatory Faucet



TX 118 LECBR

EGO-II

Cross Handle Combination
Wall Type Lavatory Faucet



TX 119 LESBR

EGO-II

8" Lavatory Faucet
With 1¼" Pop-Up Waste



TX 119 LEL

EGO-II

8" Lever Handle Lavatory Faucet
With 1¼" Pop-Up Waste



TX 119 LECBR

EGO-II

8" Cross Handle Lavatory Faucet
With 1¼" Pop-Up Waste



TX 304 BESBR

EGO-II

3 Holes Bidet Faucet
With 1¼" Pop-Up Waste



TX 304 BECBR

EGO-II

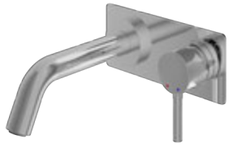
Cross Handle 3 Holes Bidet Faucet
With 1¼" Pop-Up Waste



TX 303 BESBR

EGO-II

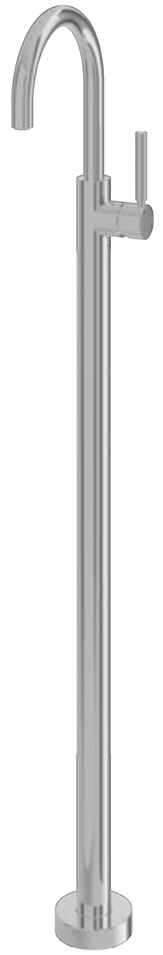
Single Lever Bidet Faucet
With 1¼" Pop-Up Waste



TX 120 LESBR

EGO-II

Single Lever Wall Type
Lavatory Faucet



TX 128 LELBR

EGO-II

Lever Handle Floor Standing
Single Lever Lavatory Faucet



TX 445 SESMV3BR

EGO-II — Floor Standing Bath & Shower Set



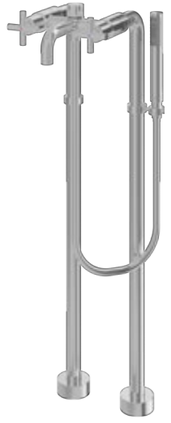
TX 445 SELMV3N

EGO-II — Lever Handle Floor Standing Bath & Shower Set



TX 494 SELBR

EGO-II — Lever Handle Floor Standing Single Lever Bath & Shower Set



TX 445 SECMV3BR

EGO-II — Cross Handle Floor Standing Bath & Shower Set



TX 494 SELV1BR

EGO-II — Lever Handle Floor Standing Single Lever Bath Filler



TMC 95 ECR

Thermostat Shower Column Set



TX 454 SESZ

EGO-II Thermostat Shower Column Set



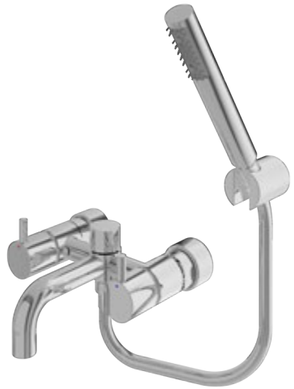
TX 492 SESZ

EGO-II Shower Column Set



TX 492 SELZ

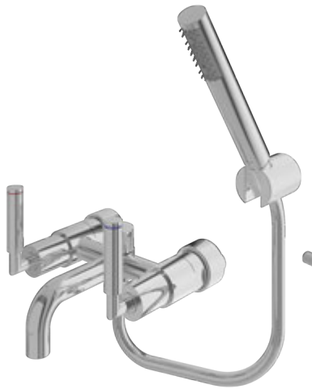
EGO-II Lever Handle Shower Column Set



TX 445 SESMBR

EGO-II

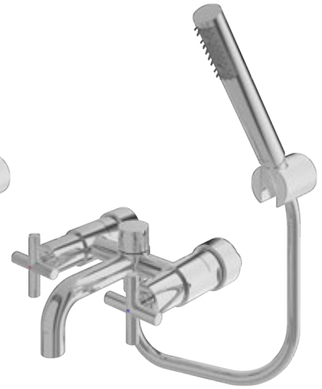
Combination Bath & Shower Set



TX 445 SELM

EGO-II

Lever Handle Combination
Bath & Shower Set



TX 445 SECMBR

EGO-II

Cross Handle Combination
Bath & Shower Set



TX 446 SESMBR

EGO-II

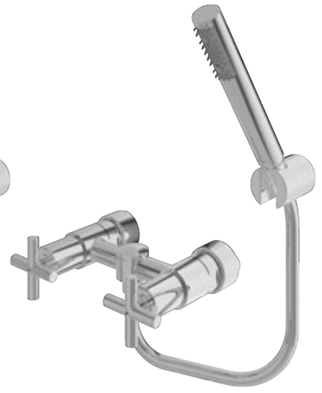
Combination Shower Set



TX 446 SELM

EGO-II

Lever Handle Combination
Shower Set



TX 446 SECMBR

EGO-II

Cross Handle Combination
Shower Set



TX 449 SEV2N

EGO-II

Thermostat Bath & Shower Set



TX 450 SEV2

EGO-II

Thermostat Shower Set



TX 471 SESMBR

EGO-II

Single Lever Bath & Shower Set



TX 474 SESMBR

EGO-II

Single Lever Shower Set



TX 472 SESM

EGO-II

Hand Shower With Wall Outlet



TX 721 AESN

EGO-II

Sliding Rail (523 mm)



TX 467 SESBR

EGO-II

Bath Filler & Mixer



TX 467 SEL

EGO-II

Bath Filler & Mixer



TX 447 SESBR

EGO-II

4 Holes Bath & Shower Set



TX 447 SEL

EGO-II

Lever Handle 4 Holes
Bath & Shower Set



TX 467 SECBR

EGO-II

Bath Filler & Mixer



TX 447 SECBR

EGO-II

Cross Handle 4 Holes
Bath & Shower Set



TX 441 SE

Bath Spout (PJ 1/2")

Available:
TX 441 SEV1 (PJ 3/4")



TX 470 SEN

Bath Spout With Diverter
For Hand Shower (PJ 1/2")



TX 452 SES

EGO-II

Stop Valve

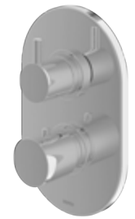


TX 451 SESBR

EGO-II

Thermostat Bath or Shower Mixer
With Stop Valve

38°C



TX 473 SESBR

EGO-II

Thermostat Bath & Shower Mixer
With Diverter & Stop Valve

Available:
TX 473 SESV1BR
For Fixed Shower Head &
Hand Shower

38°C



TX 465 SEN

Fixed Shower Head
(3S Soft)
L: 189 mm
Size: 120 mm diameter



TX 475 SEZ

Fixed Shower Head
(Ceiling Type)
L: 164 mm
Size: 180 mm diameter



TX 484 SES

EGO-II

3 Way Diverter (1 in 3 out)

Available:
TX 453 SES
2 Way Diverter (1 in 2 out)



TX 443 SESBR

EGO-II

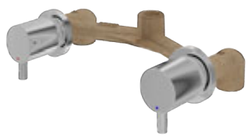
Single Lever Shower Mixer



TX 442 SESBR

EGO-II

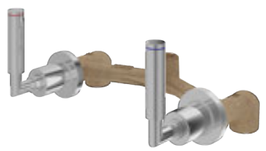
Single Lever Bath & Shower Mixer
With Diverter



TX 468 SESBR

EGO-II

Mixing Valve For Shower



TX 468 SEL

EGO-II

Lever Handle Mixing Valve
For Shower



TX 468 SECBR

EGO-II

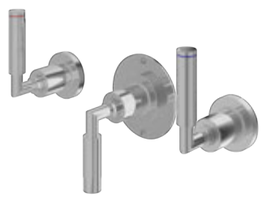
Cross Handle Mixing Valve
For Shower



TX 469 SESBR

EGO-II

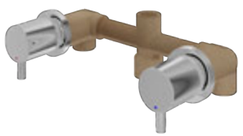
Mixing Valve For Bath & Shower
With Diverter



TX 469 SEL

EGO-II

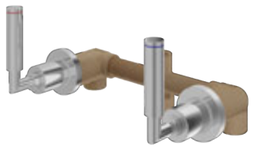
Lever Handle Mixing Valve
For Bath & Shower With Diverter



TX 468 SBESBR

EGO-II

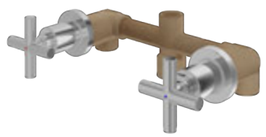
Mixing Valve For Bath & Shower



TX 468 SBEL

EGO-II

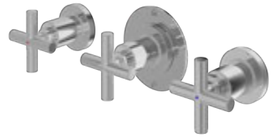
Lever Handle Mixing Valve
For Bath & Shower With Diverter



TX 468 SBECBR

EGO-II

Cross Handle Mixing Valve
For Bath & Shower



TX 469 SECBR

EGO-II

Cross Handle Mixing Valve For
Bath & Shower With Diverter

EGO III





TX 115 LEJBR

EGO-III

Single Lever Lavatory Faucet
With 1¼" Pop-Up Waste



TX 116 LEJBR

EGO-III

Extended Single Lever Lavatory
Faucet With 1" Pop-Up Waste
Height: 391 mm



TX 116 LEJV4BR

EGO-III

Extended Single Lever Lavatory
Faucet With 1¼" Pop-Up Waste
Height: 305 mm



TX 132 LEJBR

EGO-III

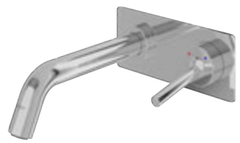
Single Lever Two Holes Lavatory
Faucet With 1" Pop-Up Waste
Height: 323 mm



TX 132 LEJV4BR

EGO-III

Single Lever Two Holes Lavatory
Faucet With 1¼" Pop-Up Waste
Height: 238 mm



TX 120 LEJBR

EGO-III

Single Lever Wall Type
Lavatory Faucet



TX 303 BEJBR

EGO-III

Single Lever Bidet Faucet
With 1¼" Pop-Up Waste



TX 471 SEJBR

EGO-III

Single Lever Bath & Shower Set



TX 474 SEJBR

EGO-III

Single Lever Shower Set

PLANO





TX 115 LP

PLANO

Single Lever Lavatory Faucet
With 1¼" Pop-Up Waste



TX 442 SP

PLANO

Single Lever Bath & Shower Mixer
With Diverter



TX 443 SP

PLANO

Single Lever Shower Mixer



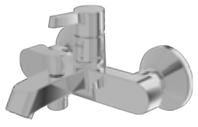
TX 471 SP

PLANO — Single Lever Bath & Shower Set



TX 474 SP

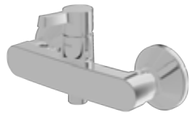
PLANO — Single Lever Shower Set



TX 471 SPV1

PLANO

Single Lever Bath & Shower Mixer



TX 474 SPV1

PLANO

Single Lever Shower Mixer

TX 402 SP

PLANO — Hand Shower Set With Stop Valve

CONTEMPORARY



The Contemporary collections encapsulate beauty and versatility in one harmonious form. They are perfectly suitable for private homes as well as commercial spaces.

COCKTAIL

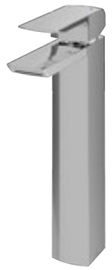




TX 115 LKBR

COCKTAIL

Single Lever Lavatory Faucet
With 1¹/₄" Pop-Up Waste

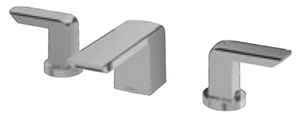


TX 116 LKBR

COCKTAIL

Extended Single Lever Lavatory Faucet With 1" Pop-Up Waste
Height: 273 mm

Available:
TX 116 LKV4BR
Height: 224 mm



TX 119 LKBR

COCKTAIL

8" Lavatory Faucet
With 1¹/₄" Pop-Up Waste



TX 451 SKBR

COCKTAIL — Thermostat Bath or Shower Mixer With Stop Valve

38°C



TX 473 SKBR

COCKTAIL — Thermostat Bath & Shower Mixer With Diverter & Stop Valve

Available:
TX 473 SKV1BR
For Fixed Shower Head & Hand Shower

38°C



TX 303 BKBR

COCKTAIL

Single Lever Bidet Faucet
With 1¹/₄" Pop-Up Waste



TX 442 SK

COCKTAIL

Single Lever Bath & Shower Mixer With Diverter



TX 443 SK

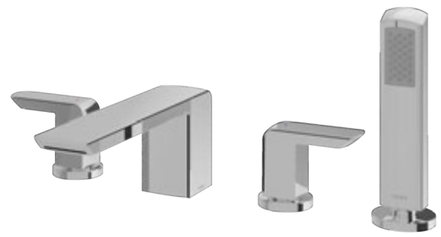
COCKTAIL

Single Lever Shower Mixer



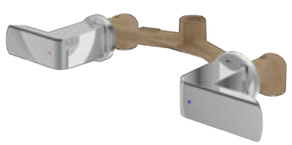
TX 467 SKBR

COCKTAIL — Bath Filler & Mixer



TX 447 SKBR

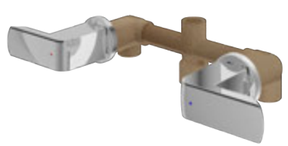
COCKTAIL — 4 Holes Bath & Shower Set



TX 468 SKBR

COCKTAIL

Mixing Valve For Shower



TX 468 SBKBR

COCKTAIL

Mixing Valve For Bath & Shower



TX 469 SKBR

COCKTAIL

Mixing Valve For Bath & Shower
With Diverter



TX 474 SKBR

COCKTAIL Single Lever Shower Set



TX 452 SK

COCKTAIL

Stop Valve



TX 484 SK

COCKTAIL

3 Way Diverter (1 in 3 out)

Available:
TX 453 SK
2 Way Diverter (1 in 2 out)



TX 471 SKBR

COCKTAIL Single Lever Bath & Shower Set

OPUS





TX 115 LOBR

OPUS

Single Lever Lavatory Faucet
With 1¹/₄" Pop-Up Waste



TX 116 LOBR

OPUS

Extended Single Lever Lavatory
Faucet With 1¹/₄" Pop-Up Waste
Height: 248 mm



TX 119 LOBR

OPUS

8" Lavatory Faucet
With 1¹/₄" Pop-Up Waste



TX 303 BOBR

OPUS

Single Lever Bidet Faucet
With 1¹/₄" Pop-Up Waste



TX 442 SOBR

OPUS

Single Lever Bath & Shower Mixer
With Diverter



TX 443 SOBR

OPUS

Single Lever Shower Mixer



TX 451 SOBR

OPUS

Thermostat Bath or Shower Mixer
With Stop Valve

38°C



TX 473 SOBR

OPUS

Thermostat Shower Mixer
With Diverter & Stop Valve

38°C



TX 467 SOBR

OPUS

Bath Filler & Mixer



TX 447 SOBR

OPUS

4 Holes Bath & Shower Set



TX 468 SOBR

OPUS

Mixing Valve For Shower



TX 468 SBOBR

OPUS

Mixing Valve For Bath & Shower



TX 469 SOBR

OPUS

Mixing Valve For Bath & Shower
With Diverter



TX 452 SO

OPUS

Stop Valve



TX 484 SO

OPUS

3 Way Diverter (1 in 3 out)

Available:
TX 453 SO
2 Way Diverter (1 in 2 out)



TX 471 SOBR

OPUS Single Lever Bath & Shower Set



TX 474 SOBR

OPUS Single Lever Shower Set



TX 450 SOBR

OPUS Thermostat Shower Set

38°C



TX 488 SON

OPUS
Fixed Shower Head

L: 400mm
Size: 250 x 200 mm (Rectangle)



TX 491 SON

OPUS
Fixed Shower Head
(Ceiling Type)

L: 194 mm
Size: 250 x 200 mm (Rectangle)



TX 454 SOBR

OPUS

Thermostat Shower Column Set

38°C

FIORE





TX 115 LFBR

FIORE

Single Lever Lavatory Faucet
With 1¼" Pop-Up Waste



TX 303 BFBR

FIORE

Single Lever Bidet Faucet
With 1¼" Pop-Up Waste



TX 119 LFBR

FIORE

8" Lavatory Faucet
With 1¼" Pop-Up Waste



TX 467 SFBR

FIORE Bath Filler & Mixer



TX 447 SFBR

FIORE 4 Holes Bath & Shower Set



TX 441 SF

FIORE

Bath Spout (PT ½")

Available:
TX 441 SFV1 (PT ¾")



TX 470 SFV2

FIORE

Bath Spout With Diverter For
Hand Shower (PT ¾")



TX 470 SF

FIORE

Bath Spout With (PT ½")

Available:
TX 470 SFV1 (PT ¾")



TX 452 SF

FIORE Stop Valve



TX 484 SF

FIORE 3 Way Diverter (1 in 3 out)

Available:
TX 453 SF
2 Way Diverter (1 in 2 out)



TX 474 SFMBR

FIORE — Single Lever Shower Set (3S Soft)



TX 450 SFMBR

FIORE — Thermostat Shower Set (3S Soft)



TX 471 SFMBR

FIORE — Single Lever Bath & Shower Set (3S Soft)



TX 449 SFMBR

FIORE — Thermostat Bath & Shower Set (3S Soft)

38°C



TX 451 SFBR

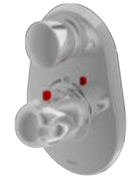
FIORE — Thermostat Bath or Shower Mixer With Diverter & Stop Valve

38°C



TX 443 SFBR

FIORE — Single Lever Shower Mixer



TX 473 SFBR

FIORE — Thermostat Bath & Shower Mixer With Diverter & Stop Valve

Available:
TX 473 SFV1BR
For Fixed Shower Head & Hand Shower

38°C



TX 442 SFBR

FIORE — Single Lever Bath & Shower Mixer With Diverter



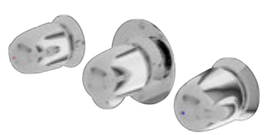
TX 468 SFBR

FIORE — Mixing Valve For Shower



TX 468 SBFBR

FIORE — Mixing Valve For Bath & Shower



TX 469 SFBR

FIORE — Mixing Valve For Bath & Shower With Diverter



TX 454 SFN

FIORE — Thermostat Shower Column Set

38°C

REI

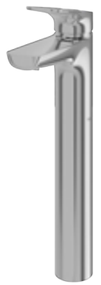




TX 115 LRR

REI-R

Single Lever Lavatory Faucet
With 1¹/4" Pop-Up Waste



TX 116 LRR

REI-R

Extended Single Lever Lavatory
Faucet With 1" Pop-Up Waste
Height: 310 mm



TX 119 LRR

REI-R

8" Lavatory Faucet
With 1¹/4" Pop-Up Waste



TX 447 SRR

REI-R

4 Holes Bath & Shower Set



TX 442 SRR

REI-R

Single Lever Bath & Shower
Mixer With Diverter



TX 443 SRR

REI-R

Single Lever Shower Mixer



TX 467 SRR

REI-R

Bath Filler & Mixer



TX 496 SRR

REI-R

3 Holes Bath & Shower Set



TX 471 SRR

REI-R — Single Lever Bath & Shower Set (5S Massage)



TX 474 SRR

REI-R — Single Lever Shower Set (5S Massage)



TX 492 SRRZ

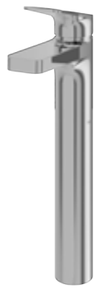
REI-R — Lever Handle Shower Column Set



TX 115 LRS

REI-S

Single Lever Lavatory Faucet
With 1¹/4" Pop-Up Waste



TX 116 LRS

REI-S

Extended Single Lever Lavatory
Faucet With 1" Pop-Up Waste
Height: 248 mm



TX 119 LRS

REI-S

8" Lavatory Faucet
With 1¹/4" Pop-Up Waste



TX 447 SRSN

REI-S

4 Holes Bath & Shower Set



TX 442 SRS

REI-S

Single Lever Bath & Shower
Mixer With Diverter



TX 443 SRS

REI-S

Single Lever Shower Mixer



TX 467 SRS

REI-S

Bath Filler & Mixer



TX 496 SRSN

REI-S

3 Holes Bath & Shower Set



TX 471 SRSN

REI-S — Single Lever Bath & Shower Set (5S Massage)



TX 474 SRSN

REI-S — Single Lever Shower Set (5S Massage)



TX 492 SRS

REI-S — Lever Handle Shower Column Set (5S Massage)

JAZZ





TX 108 LJ

JAZZ

Single Lever Lavatory Faucet
With 1¹/₄" Pop-Up Waste



TX 301 BJ

JAZZ

Single Lever Bidet Faucet
With 1¹/₄" Pop-Up Waste



TX 405 SJ

JAZZ

Single Lever Shower Mixer



TX 432 SJN

JAZZ Single Lever Bath & Shower Set



TX 433 SJN

JAZZ Single Lever Shower Set



TX 404 SJN

JAZZ

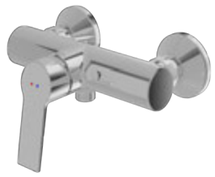
Single Lever Bath & Shower Mixer
With Diverter



TX 432 SJV1

JAZZ

Single Lever Bath & Shower Mixer



TX 433 SJV1

JAZZ

Single Lever Shower Mixer



TX 472 SJN

JAZZ Hand Shower Set With Wall Outlet

BELLA





TX 101 LB

BELLA — Single Lever Lavatory Faucet
With 1¹/₄" Pop-Up Waste



TX 301 BB

BELLA — Single Lever Bidet Faucet
With 1¹/₄" Pop-Up Waste



TX 405 SB

BELLA — Single Lever Shower Mixer



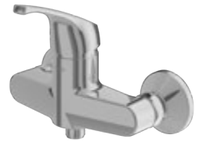
TX 404 SB

BELLA — Single Lever Bath & Shower
Mixer With Diverter



TX 401 SBV1

BELLA — Single Lever Bath & Shower Mixer



TX 401 SBV2

BELLA — Single Lever Shower Mixer



TX 401 SBV5

BELLA — Single Lever Shower Set
(2S Massage)



TX 401 SB

BELLA — Single Lever Bath & Shower Set
(2S Massage)

HELIO





TX 108 LHBR

HELIO — Single Lever Lavatory Faucet
With 1¹/₄" Pop-Up Waste



TX 301 BHBR

HELIO — Single Lever Bidet Faucet
With 1¹/₄" Pop-Up Waste



TX 405 SHBR

HELIO — Single Lever Shower Mixer



TX 404 SHNBR

HELIO — Single Lever Bath & Shower
Mixer With Diverter



TX 432 SHV1BR

HELIO — Single Lever Bath & Shower Mixer



TX 433 SHV1BR

HELIO — Single Lever Shower Mixer



TX 432 SHBR

HELIO — Single Lever Bath & Shower Set



TX 433 SHBR

HELIO — Single Lever Shower Set

UMI





TX 115 LU

UMI — Single Lever Lavatory Faucet
With 1¼" Pop-Up Waste

TX 442 SU

UMI — Single Lever Bath & Shower
Mixer With Diverter



TX 443 SU

UMI — Single Lever Shower Mixer



TX 471 SU

UMI — Single Lever Bath & Shower Set



TX 474 SU

UMI — Single Lever Shower Set

DONNA





TX 108 LDN

DONNA

Single Lever Lavatory Faucet
With 1¼" Pop-Up Waste



TX 405 SD

DONNA

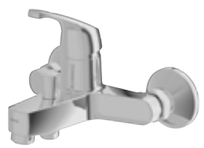
Single Lever Shower Mixer



TX 404 SDN

DONNA

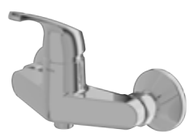
Single Lever Bath & Shower
Mixer With Diverter



TX 432 SDV1

DONNA

Single Lever Bath & Shower Mixer



TX 433 SDV1

DONNA

Single Lever Shower Mixer



TX 432 SD

DONNA Single Lever Bath & Shower Set

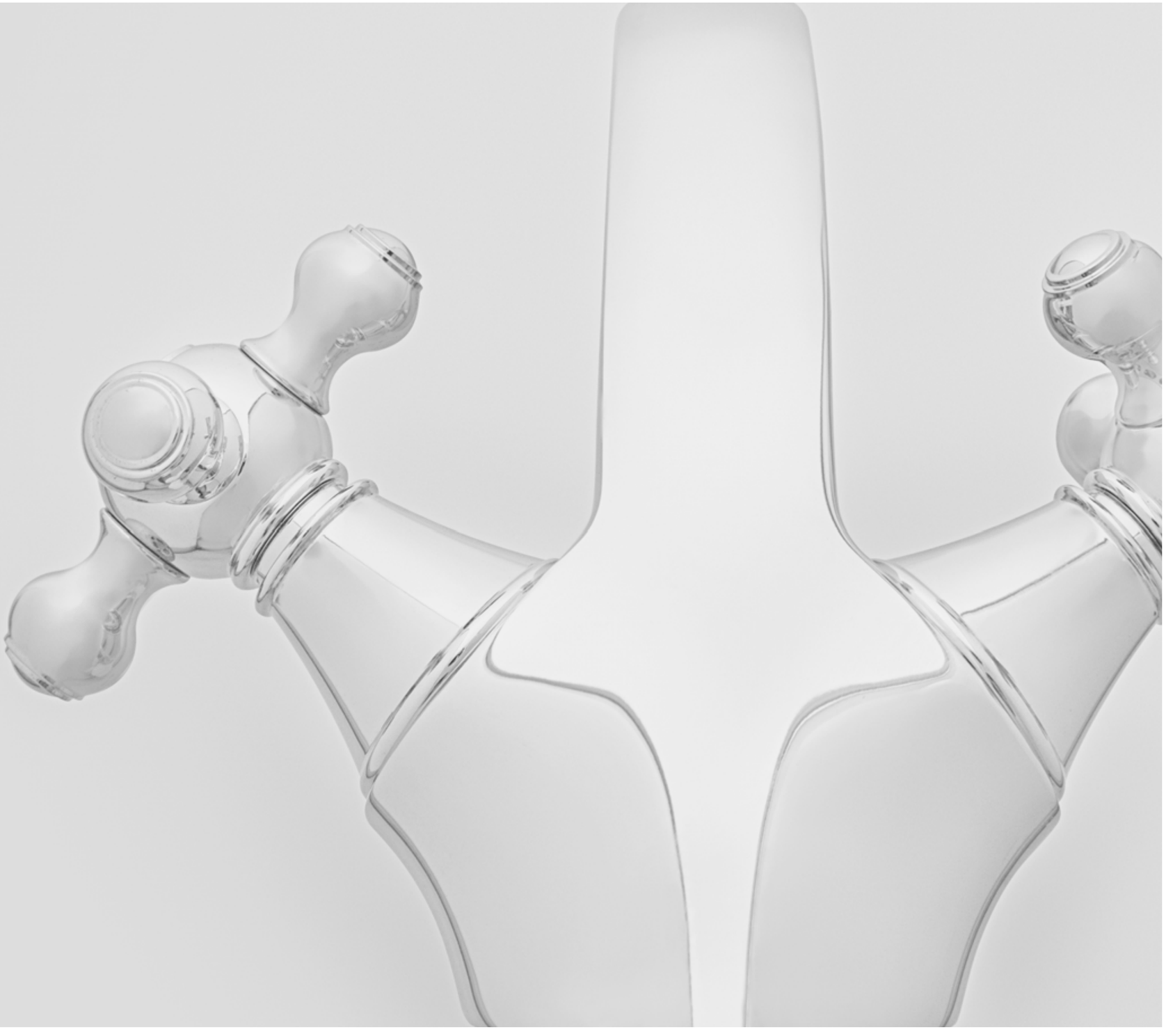


TX 433 SD

DONNA Single Lever Shower Set

CLASSIC

The Classic collections are dedicated to the romantic at heart. Their graceful, sinuous shapes will lend a touch of grandeur to your homes.



GLORIA





TX 103 LG

GLORIA

8" Lever Handle Lavatory Faucet
With 1¼" Pop-Up Waste



TX 119 LGV1

GLORIA

8" Lever Handle Lavatory Faucet
With 1¼" Pop-Up Waste



TX 108 LG

GLORIA

Single Lever Lavatory Faucet
With 1¼" Pop-Up Waste



TX 301 BG

GLORIA

Single Lever Bidet Faucet
With 1¼" Pop-Up Waste



TX 405 SG

GLORIA

Single Lever Shower Mixer



TX 404 SGN

GLORIA

Single Lever Bath & Shower
Mixer With Diverter



TX 473 SG

GLORIA

Thermostat Bath & Shower Mixer
With Diverter & Stop Valve

Available:
TX 473 SGV1
For Fixed Shower Head & Hand
Shower

38°C



TX 484 SG

GLORIA

Lever Handle
3 Way Diverter (1 in 3 out)



TX 467 SGV1

GLORIA

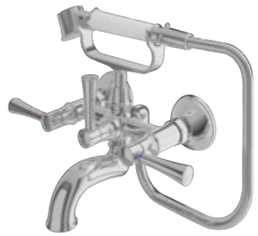
Lever Handle Bath Filler & Mixer



TX 447 SGV1

GLORIA

Lever Handle 4 Holes
Bath & Shower Set



TX 411 SG

GLORIA — Lever Handle Combination Bath & Shower Set



TX 432 SG

GLORIA — Single Lever Bath & Shower Set



TX 411 SGV3N

GLORIA — Lever Handle Floor Standing Bath & Shower Set



TX 492 SGN

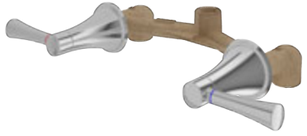
GLORIA — Lever Handle Shower Column Set



TX 417 SG

GLORIA

Lever Handle Mixing Valve For Bath & Shower With Diverter



TX 419 SG

GLORIA

Lever Handle Mixing Valve For Shower



TX 418 SG

GLORIA

Bath Spout (PT 3/4")

Available:
TX 418 SGV1 (PT 1/2")



TX 421 SG

GLORIA

Lever Handle Stop Valve



TX 103 LGNCBR

GLORIA

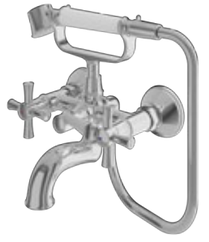
8" Cross Handle Lavatory Faucet
With 1 1/4" Pop-Up Waste



TX 119 LGNCV1BR

GLORIA

8" Cross Handle Lavatory Faucet
With 1 1/4" Pop-Up Waste



TX 411 SGNCBR

GLORIA

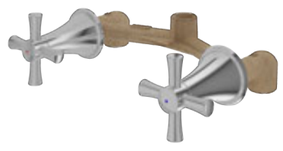
Cross Handle Combination
Bath & Shower Set



TX 417 SGNCBR

GLORIA

Cross Handle Mixing Valve
For Bath & Shower With Diverter



TX 419 SGNCBR

GLORIA

Cross Handle Mixing Valve
For Shower



TX 421 SGNC

GLORIA

Cross Handle Stop Valve



TX 467 SGNCV1BR

GLORIA — Cross Handle Bath Filler & Mixer



TX 447 SGNCV1BR

GLORIA — Cross Handle 4 Holes Bath & Shower Set



TX 411 SGNCV3BR

GLORIA — Cross Handle Floor Standing Bath & Shower Set



TX 492 SGNC

GLORIA — Cross Handle Shower Column Set

CURIO





TX 103 LCBR

CURIO

8” Lavatory Faucet
With 1¼” Pop-Up Waste



TX 110 LCBR

CURIO

Single Hole Lavatory Faucet
With 1¼” Pop-Up Waste



TX 302 BCBR

CURIO

Single Hole Bidet Faucet
With 1¼” Pop-Up Waste



TX 491 SCZ

CURIO

Fixed Shower Head
(Ceiling Type)
L: 200 mm
Size: 250 mm diameter



TX 488 SCZ

CURIO

Fixed Shower Head
L: 400 mm
Size: 250 mm diameter



TX 421 SC

CURIO

Stop Valve



TX 419 SCBR

CURIO

Mixing Valve For Shower



TX 417 SBCBR

CURIO

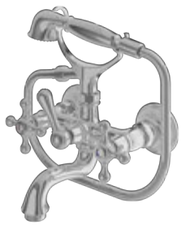
Mixing Valve For Bath & Shower
With Diverter



TX 430 SCBR

CURIO

Bath Filler & Mixer



TX 411 SCBR

CURIO

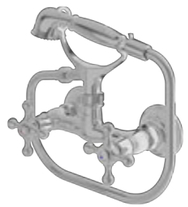
Combination Bath & Shower Set



TX 411 SCV3BR

CURIO

Floor Standing Bath & Shower Set



TX 416 SCBR

CURIO

Combination Shower Set



TX 422 SC

CURIO

Fixed Shower Head (3S Soft)
L: 230 mm
Size: 120 mm diameter



TX 418 S

CURIO

Bath Spout (PT $^{3}/_{4}$")

Available:
TX 418 SV1 (PT $^{1}/_{2}$")



TX 492 SC

CURIO Shower Column Set



TX 484 SCL

CURIO — 3 Way Diverter (1 in 3 out)

Available:
TX 453 SCL
2 Way Diverter (1 in 2 out)



TX 421 SCL

CURIO — Stop Valve



TX 417 SBCLBR

CURIO — Mixing Valve For Bath & Shower With Diverter



TX 419 SCLBR

CURIO — Mixing Valve For Shower



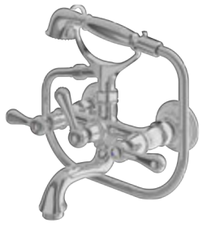
TX 103 LCLBR

CURIO — 8" Lavatory Faucet
With 1 1/4" Pop-Up Waste



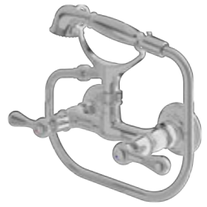
TX 430 SCLBR

CURIO — Bath Filler & Mixer



TX 411 SCLBR

CURIO — Combination Bath & Shower Set



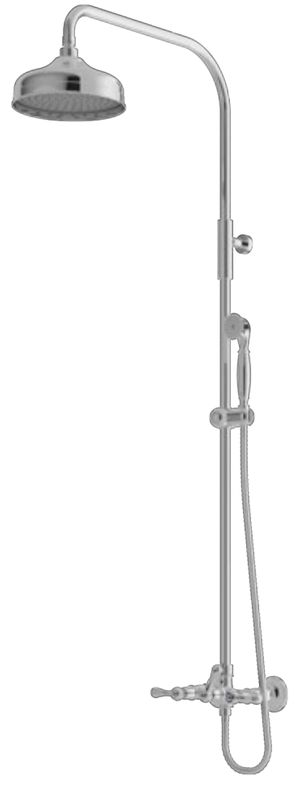
TX 416 SCLBR

CURIO — Combination Shower Set



TX 411 SCLV3BR

CURIO — Floor Standing Bath & Shower Set



TX 492 SCL

CURIO — Lever Handle Shower Column Set

CROWN





TGL 600 RYRV1N

CROWN

8" Lavatory Faucet
With 1¼" Pop-Up Waste



TX 110 LRYRN

CROWN

Single Hole Lavatory Faucet
With 1¼" Pop-Up Waste



TX 302 BRYR

CROWN

Single Hole Bidet Faucet
With 1¼" Pop-Up Waste



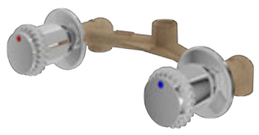
TX 484 SRYR

CROWN	3 Way Diverter (1 in 3 out)
	Available: TX 453 SRYR 2 Way Diverter (1 in 2 out)



TGB 9 RYR

CROWN	Stop Valve



TGB 21 SRYRN

CROWN

Mixing Valve For Shower



TGB 21 SBRYRN

CROWN

Mixing Valve For Bath & Shower



TX 430 SRYRN

CROWN

Bath Filler & Mixer



TS 308 RYR

CROWN	Combination Bath & Shower Set (2S Massage)



TS 309 RYR

CROWN	Combination Shower Set (2S Massage)



TGL 600 RYNV1N

CROWN

8" Lavatory Faucet
With 1¼" Pop-Up Waste



TX 110 LRYNN

CROWN

Single Hole Lavatory Faucet
With 1¼" Pop-Up Waste



TX 302 BRYN

CROWN

Single Hole Bidet Faucet
With 1¼" Pop-Up Waste



TX 484 SRYN

CROWN

3 Way Diverter (1 in 3 out)

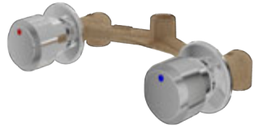
Available:
TX 453 SRYN
2 Way Diverter (1 in 2 out)



TGB 9 RYN

CROWN

Stop Valve



TGB 21 SRYNN

CROWN

Mixing Valve For Shower



TGB 21 SBRYNN

CROWN

Mixing Valve For Bath & Shower



TX 430 SRYNN

CROWN

Bath Filler & Mixer



TS 308 RYN

CROWN

Combination Bath & Shower Set
(2S Massage)



TS 309 RYN

CROWN

Combination Shower Set
(2S Massage)

SATIN





TX 115 LS

SATIN — Single Lever Lavatory Faucet With 1¼" Pop-Up Waste



TX 119 LS

SATIN — Cross Handle 8" Lavatory Faucet With 1¼" Pop-Up Waste



TX 442 SS

SATIN — Single Lever Bath & Shower Mixer With Diverter



TX 443 SS

SATIN — Single Lever Shower Mixer



TX 453 SS

SATIN — 2 Way Diverter (1 in 2 out)



TX 468 SS

SATIN — Mixing Valve For Shower



TX 469 SS

SATIN — Mixing Valve For Bath & Shower With Diverter



TX 445 SS

SATIN — Cross Handle Combination Bath & Shower Set



TX 446 SS

SATIN — Cross Handle Combination Shower Set



TX 452 SS

SATIN — Stop Valve



TX 721 AS

SATIN — Sliding Rail (600 mm)

SHOWER





TX 488 SQN

Fixed Shower Head
L : 400 mm
Size : 220 x 340 mm (Oval Shape)



TX 488 SMZ

Fixed Shower Head With Air Drop
L : 400 mm
Size : 300 mm diameter



TX 488 SCZ

Fixed Shower Head
L : 400 mm
Size : 250 mm diameter



TX 488 SZ

Fixed Shower Head
L : 400 mm
Size : 230 mm diameter



TX 488 SLZ

Fixed Shower Head
L : 400 mm
Size : 250 mm diameter



TX 488 SIZ

Fixed Shower Head
L : 400 mm
Size : 300 x 300 mm



TX 488 SON

Fixed Shower Head
L : 400 mm
Size : 250 x 200 mm (Rectangle)



TX 488 ST

Fixed Shower Head With Air Drop
L : 400 mm
Size : 250 x 250 mm (Rectangle)



TX 497 S

LED Fixed Shower Head
L : 400 mm
Size : 300 mm diameter



TX 498 S

LED Fixed Shower Head
L : 400 mm
Size : 300 x 300 mm



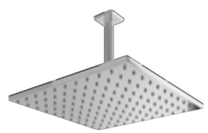
TX 491 SQN

Fixed Shower Head
(Ceiling Type)
L : 190 mm
Size : 220 x 340 mm (Oval Shape)



TX 491 SMZ

Fixed Shower Head With Air Drop
(Ceiling Type)
L : 190 mm
Size : 220 x 340 mm (Oval Shape)



TX 491 SIZ

Fixed Shower Head
(Ceiling Type)
L : 186 mm
Size : 300 x 300 mm



TX 491 SCZ

Fixed Shower Head
(Ceiling Type)
L : 200 mm
Size : 250 mm diameter



TX 491 SN

Fixed Shower Head
(Ceiling Type)
L : 200 mm
Size : 230 mm diameter



TX 491 SLZ

Fixed Shower Head
(Ceiling Type)
L : 194 mm
Size : 250 mm diameter



TX 491 SON

Fixed Shower Head
(Ceiling Type)
L : 194 mm
Size : 250 x 200 mm (Rectangle)



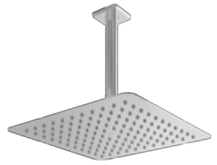
TX 497 SV1

LED Fixed Shower Head
L : 227 mm
Size : 300 mm diameter



TX 498 SV1N

LED Fixed Shower Head
(Ceiling Type)
L : 227 mm
Size : 300 x 300 mm



TX 491 ST

Fixed Shower Head With Air Drop
(Ceiling Type)
L : 199 mm
Size : 250 x 250 mm (Rectangle)



TX 475 SEZ

Fixed Shower Head
(Ceiling Type)
L : 164 mm
Size : 180 mm diameter



TX 465 SMN

Fixed Shower Head
L : 178 mm
Size : 105 mm diameter



TX 465 SEN

Fixed Shower Head
(3S Soft)
L : 189 mm
Size : 120 mm diameter



TX 465 SL

Fixed Shower Head
(3S Soft)
L : 189 mm
Size : 120 mm diameter



TB 18 D

Fixed Shower Head
(Adjustable Spray)



TX 438 SE

Fixed Shower Head
L : 194 mm
Size : 65 mm diameter



TX 438 SEM

Fixed Shower Head
(3S Massage)
L : 202 mm
Size : 65 mm diameter



TX 466 S

Fixed Shower Head
L : 171 mm
Size : 75 mm diameter



TX 466 SM

Fixed Shower Head
(2S Massage)
L : 171 mm
Size : 75 mm diameter



TX 422 SC

Fixed Shower Head
(3S Massage)
L : 230 mm
Size : 120 mm diameter



THX 118 SFMN

Hand Shower Set
(3S Soft)



THX 118 SE

Hand Shower Set
(3S Massage)



THX 118 SESM

Hand Shower Set



THX 118 SLN

Hand Shower Set
(3S Soft)



THX 118 SI

Hand Shower Set



THX 118 SK

Hand Shower Set



THX 118 SG

Hand Shower Set



THX 118 SM

Hand Shower Set



THX 118 SRR

Hand Shower Set
(5S Massage)



THX 118 ST

Hand Shower Set



THX 118 SN

Hand Shower Set



THX 118 SO

Hand Shower Set



THX 118 SJN

Hand Shower Set



THX 19 B

Hand Shower Set
(2S Massage)



THX 48 B

Hand Shower Set



THX 17 B

Hand Shower Set



TX 402 S

Hand Shower Set With Stop Valve



TX 402 SP

Hand Shower Set With Stop Valve



TX 423 S

Hand Shower Set With Sink Tap



TX 721 AC

Sliding Rail (608 mm)



TX 721 AESN

Sliding Rail (523 mm)



TX 721 AM

Sliding Rail (900 mm)



TX 721 AEZ

Sliding Rail (625 mm)



TX 721 AN

Sliding Rail (638 mm)

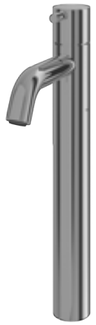


TX 721 AS

Sliding Rail (600 mm)

SINGLE FAUCET





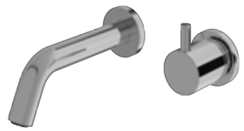
TX 123 LES

Extended Lavatory Faucet
Height : 340 mm



TX 123 LESV4

Extended Lavatory Faucet
Height : 255 mm



TX 124 LES

Lavatory Faucet



TX 109 LD

Single Lever Lavatory Faucet



TX 109 LP

Single Lever Lavatory Faucet



TX 109 LH

Single Lever Lavatory Faucet



TX 126 LE

Self Closing Lavatory Faucet



TX 122 LES

Lavatory Faucet



TX 133 L

Lavatory Faucet
P : 130

Available:
TX 133 LV1
P : 220



TX 109 LJ

Single Lever Lavatory Faucet



TX 109 LRS

Single Lever Lavatory Faucet



TX 109 LRR

Single Lever Lavatory Faucet



TX 125 LES

Lavatory Faucet
Height : 110 mm



TX 125 LESV1

Extended Lavatory Faucet
Height : 150 mm



TX 125 LESV2

Extended Lavatory Faucet
Height : 234 mm



TX 111 LRYR

Lavatory Faucet

Available:
TX 111 LRYN



T 205 QN

Lever Handle Lavatory Faucet



TX 109 LE

Single Lever Lavatory Faucet



TX 127 L

Lavatory Faucet



T 205 MB

Lavatory Faucet



TX 129 L

Lavatory Faucet

KITCHEN FAUCET





TKN 34 PBN

Single Lever Kitchen Faucet With Pull-Out Spray



TX 608 KNBR

Single Lever Kitchen Faucet With Pull-Out Spray



TX 605 KMBR

Single Lever Kitchen Faucet



TX 603 KCS

Kitchen Faucet



TX 606 KES

Kitchen Faucet (Cold Only)



TX 603 KM

Kitchen Faucet



TX 604 KDN

Single Lever Kitchen Faucet



TX 605 KESBR

Single Lever Kitchen Faucet



TX 607 KESBR

Combination Kitchen Faucet



T 30 ARQ13N

Lever Handle Sink Tap
With Swivel Spout



T 30 AR13V7N

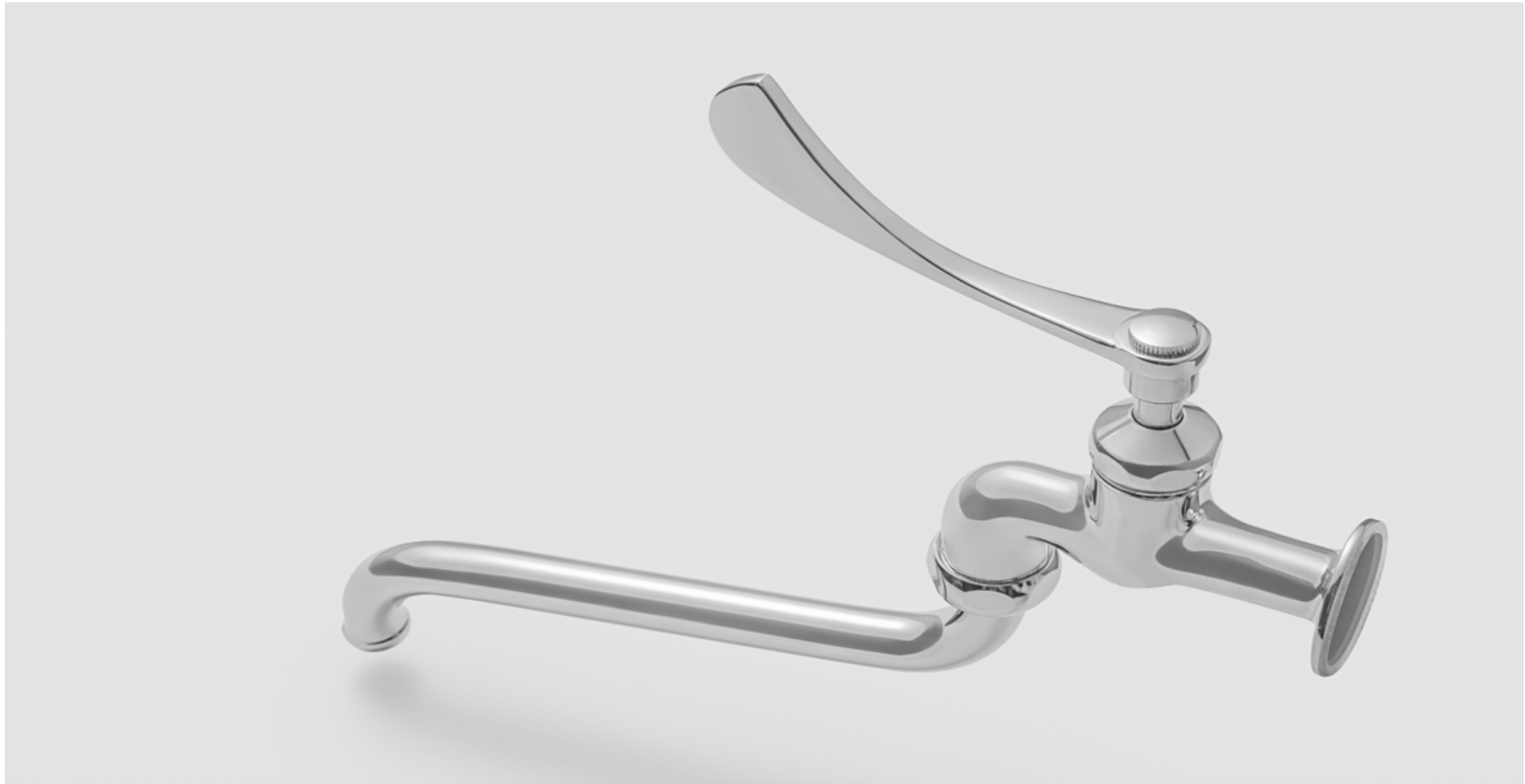
Sink Tap With Swivel Spout



TX 609 K

Wall Type Single Kitchen Faucet
With Swivel Spout (Cold Water)

SINK TAP





T 23 B13

Sink Tap



T 23 BQ13N

Lever Handle Sink Tap



T 28 UNH13

Sink Tap With Hose Coupling



TX 130 L

Sink Tap



T 26-13

Sink Tap With Hose Coupling



T 23 B13V7NB

Sink Tap



TX 131 L

Sink Tap With Shower Outlet



TX 423 ST1

Sink Tap With Shower Outlet

ACCESSORIES



LE MUSE COLLECTION



TX 701 AQ

Towel Bar
Size : 720 mm



TX 702 AQ

Hand Towel Bar
Size : 270 mm



TX 703 AQ

Paper Holder



TX 703 AQV1

Paper Holder



TX 704 AQ

Robe Hook

LOOP COLLECTION



TX 701 AL

Towel Bar
Size : 695 mm



TX 702 AL

Hand Towel Bar
Size : 245 mm



TX 703 AL

Paper Holder



TX 704 AL

Robe Hook

MONO COLLECTION



TX 701 AM

Towel Bar
Size : 660 mm



TX 702 AM

Towel Ring



TX 703 AM

Paper Holder



TX 704 AM

Robe Hook

ICON COLLECTION



TX 701 AI

Towel Bar
Size : 660 mm



TX 702 AI

Hand Towel Bar
Size : 260 mm



TX 703 AI

Paper Holder



TX 704 AI

Robe Hook

NATURA COLLECTION



TX 701 AN

Towel Bar
Size : 660 mm



TX 701 ANV1

Hand Towel Bar
Size : 300 mm



TX 702 AN

Towel Ring



TX 703 AN

Paper Holder



TX 704 AN

Robe Hook

EGO COLLECTION



TX 702 AE

Towel Ring



TX 703 AE

Paper Holder



TX 722 AE

Spare Paper Holder



TX 704 AE

Double Robe Hook



TX 706 AE

Soap Holder



TX 707 AE

Tumbler Holder

EGO COLLECTION



TX 705 AE

Glass Shelf
Size : 669 mm



TX 701 AE

Towel Bar
Size : 660 mm



TX 726 AE

Combination Towel Shelf & Towel Bar
Size : 660 mm



TX 724 AE

Double Towel Bar
Size : 660 mm

EGO II COLLECTION



TX 702 AES

Towel Ring



TX 703 AESV1

Paper Holder



TX 703 AES

Paper Holder



TX 722 AES

Spare Paper Holder

EGO II COLLECTION



TX 706 AES

Soap Holder



TX 707 AES

Tumbler Holder



TX 704 KES

Double Robe Hook



TX 704 AEZV1

Sanitary Bag Hook



TX 704 AEZ

Robe Hook

EGO II COLLECTION



TX 701 AEZ

Towel Bar
Size : 660 mm



TX 701 AES

Towel Bar
Size : 660 mm



TX 724 AES

Double Towel Bar
Size : 660 mm



TX 726 AES

Combination Towel Shelf &
Towel Bar
Size : 660 mm



TX 705 AES

Glass Shelf
Size : 500 mm

COCKTAIL COLLECTION



DS 733

Towel Bar
Size : 610 mm



DS 732

Towel Ring



DS 731

Paper Holder



DS 730

Robe Hook

REI COLLECTION



TX 701 ARR

Towel Bar
Size : 660 mm



TX 702 ARR

Hand Towel Bar
Size : 210 mm



TX 703 ARR

Paper Holder



TX 704 ARR

Robe Hook

REI COLLECTION



TX 701 ARS

Towel Bar
Size : 660 mm



TX 702 ARS

Hand Towel Bar
Size : 210 mm



TX 703 ARS

Paper Holder



TX 704 ARS

Robe Hook

JAZZ COLLECTION



TX 701 AJ

Towel Bar
Size : 660 mm



TX 702 AJ

Hand Towel Bar
Size : 210 mm



TX 703 AJ

Paper Holder



TX 704 AJ

Robe Hook

GLORIA COLLECTION



TX 701 AG

Towel Bar
Size : 660 mm



TX 702 AG

Towel Ring



TX 703 AG

Paper Holder



TX 704 AG

Double Robe Hook



TX 724 AG

Double Towel Bar
Size : 660 mm

CURIO COLLECTION



TX 701 AC

Towel Bar
Size : 660 mm



TX 702 AC

Towel Ring



TX 703 AC

Paper Holder



TX 704 AC

Robe Hook



TX 704 ACW

Double Robe Hook



TX 705 AC

Glass Shelf
Size : 600 mm

CURIO COLLECTION



TX 706 AC

Soap Holder



TX 707 AC

Tumbler Holder



TX 722 AC

Spare Paper Holder



TX 724 AC

Double Towel Bar
Size : 660 mm



TX 5 WAC

Double Towel Bar
Size : 660 mm



TX 4 WAC

Combination Towel Shelf &
Towel Bar
Size : 660 mm

CROWN COLLECTION



TX 701 ARYR

Towel Bar
Size : 660 mm



TX 702 ARYR

Towel Ring



TX 703 ARYR

Paper Holder



TX 704 ARYR

Double Robe Hook



TX 705 ARYR

Glass Shelf
Size : 600 mm

CROWN COLLECTION



TX 706 ARYR

Soap Holder



TX 707 ARYR

Tumbler Holder



TX 701 ARYN

Towel Bar
Size : 660 mm



TX 702 ARYN

Towel Ring



TX 703 ARYN

Paper Holder

CROWN COLLECTION



TX 704 ARYN

Double Robe Hook



TX 705 ARYN

Glass Shelf
Size : 600 mm



TX 706 ARYN

Soap Holder



TX 707 ARYN

Tumbler Holder

PAPER HOLDER



TX 703 AM

Paper Holder



TX 703 ARYR

Paper Holder



TX 703 AC

Paper Holder



TX 703 AE

Paper Holder



TX 703 AESV1

Paper Holder



TX 703 AES

Paper Holder

PAPER HOLDER



TX 703 AQ

Paper Holder



TX 703 AQV1

Paper Holder



TX 703 ARR

Paper Holder



TX 703 ARS

Paper Holder



TX 703 AL

Paper Holder



TX 703 AN

Paper Holder

PAPER HOLDER



TX 703 AI

Paper Holder



DS 731

Paper Holder



TX 703 AG

Paper Holder



TX 703 AJ

Paper Holder



TX 11 B

Paper Holder



YH 116

Paper Holder

PAPER HOLDER



TX 720 ACRB

Paper Holder (Chrome)

Available:
TX 720 ABW (White)
TX 720 ABPIV (Pastel Ivory)
TX 720 ABPB (Pastel Blue)
TX 720 ABMA (Manhattan)



TX 722 AC

Spare Paper Holder



TX 722 AE

Spare Paper Holder



TX 722 AES

Spare Paper Holder



S 20 V2

Semi Recessed Paper Holder
Size : 170 x 170 x 30 mm



S 20

Recessed Paper Holder
Size : 152 x 152 x 91 mm

PAPER HOLDER



AW 360 J

Paper Holder



S 20 T3

Recessed Double Paper Holder
With Ashtray
Size : 314 x 175 x 81 mm



TX 8

Recessed Tissue Dispenser
Size : 282 x 127 x 56 mm

SOAP HOLDER



S 161

Recessed Soap Holder
Size : 430 x 330 x 60 mm



S 163 N

Corner Soap Holder
Size : 200 x 400 x 200 mm



S 186

Recessed Soap Holder
With Grab Bar
Size : 305 x 166 x 60 mm



S 160 V1

Recessed Soap Holder
Size : 223 x 323 x 60 mm



S 156 N

Recessed Soap Holder
Size : 220 x 109 x 58 mm



S 156 NV1

Semi Recessed Soap Holder
Size : 220 x 110 x 25 mm

SOAP HOLDER



S 6 N

Recessed Soap Holder
Size : 148 x 148 x 58 mm



S 6 NV1

Semi Recessed Soap Holder
Size : 150 x 150 x 25 mm



S 11 N

Recessed Soap Holder
Size : 109 x 109 x 59 mm



TX 2 BV1B

Soap Basket
Size : 157 x 107 mm



TX 2 AV1B

Corner Soap Basket
Size : 208 x 158 x 158 mm



TX 2 C

Corner Soap Dish
Size : 238 x 180 x 180 mm

TOWEL HOLDER



TX 5 A1

Towel Bar
Size : 558 mm

Available:
TX 5 A2 (660 mm)



TX 5 B

Towel Bar
Size : 660 mm



TX 5 W

Double Towel Bar
Size : 660 mm



TX 4 A

Towel Shelf
Size : 500 mm

Available:
TX 4 B (660 mm)



TX 4 W

Combination Towel Shelf &
Towel Bar
Size : 660 mm



S 211 N

Shelf With Soap Dish
Size : 600 x 140 mm

TOWEL HOLDER



TS 113 A2

Towel Bar
Size : 508 mm

Available:
TS 113 A2V2 (660 mm)



TS 113 W

Double Towel Bar
Size : 610 mm



TX 3 A1

Grab Bar
Size : 350 mm

Available:
TX 3 A2 (500 mm)
TX 3 A3 (650 mm)



TX 725 AC

Swivel Double Towel Bar
Size : 450 mm

TOWEL HOLDER



AW 361 NJ

Towel Bar
Size : 660 mm



AW 371 NJ

Double Towel Bar
Size : 660 mm



TS 115 SB

Towel Ring



AW 362 NJ

Towel Ring

BATH SPOUT





TX 418 SG

Bath Spout (PJ 3/4")

Available:
TX 418 SGV1 (PT 1/2")



TX 470 SF

Bath Spout With Diverter (PT 1/2")

Available:
TX 470 SFV1 (PT 3/4")



TX 418 S

Bath Spout (PT 3/4")

Available:
TX 418 SV1 (PT 1/2")



TX 441 SF

Bath Spout (PT 1/2")

Available:
TX 441 SFV1 (PT 3/4")



TX 470 SFV2

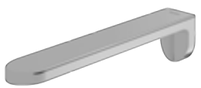
Bath Spout With Diverter For Hand Shower (PT 3/4")



TX 441 SE

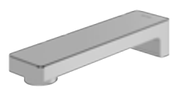
Bath Spout (PT 1/2")

Available:
TX 441 SEV1 (PT 3/4")



TX 441 SQ

Bath Spout (PJ 1/2")



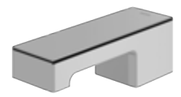
TX 441 SM

Bath Spout (PJ 1/2")



TX 470 SEN

Bath Spout With Diverter For Hand Shower (PJ 1/2")



TX 441 SI

Bath Spout (PJ 3/4")



TX 407 S

Bath Spout (PT 1/2")

Available:
TX 407 SV1 (PT 3/4")

SHOWER SPRAY





TB 19 CSMCR

Shower Spray with Tap & Hanger (Chrome)

Available:
TB 19 CSNPIV (Pastel Ivory)
TB 19 CSNW (White)
TB 19 CSNN5 (Black)



TX 423 SMCR

Shower Spray with Tap (Chrome)

Available:
TB 423 SV1NPIV (Pastel Ivory)
TB 423 SV1NW (White)
TB 423 SV1NN5 (Black)



THX 20 NBPIV

Shower Spray (Pastel Ivory)



THX 20 NBW

Shower Spray (White)



THX 20 NBN5

Shower Spray (Black)



TX 403 SMCRB

Shower Spray with Stop Valve (Chrome)

Available:
TX 403 SBPIV (Pastel Ivory)
TX 403 SBW (White)
TX 403 SBN5 (Black)



TX 403 SECR

Shower Spray with Safety Valve (Chrome)

Available:
TB 403 SEW (White)



THX 20 MCRB

Shower Spray (Chrome)



TGB 500 AZRV20

Jet-Washer



TGB 500 AZRV24

Jet-Washer

SUPPLEMENTARY FITTINGS





TC 280

Duroplast Seat & Cover With Metal Hinges (European Std.)

Available:
TC 280 SJ (Soft Closing)



TC 281 SJ

Duroplast Seat & Cover With Metal Hinges, Soft Closing (Elongated)



TC 282 SJ

Duroplast Seat & Cover With Metal Hinges, Soft Closing (European Std.)



TC 800 SJ

Duroplast Seat & Cover With Metal Hinges, Soft Closing (European Std.)



TC 811 SJ

Duroplast Seat & Cover With Metal Hinges, Soft Closing (Elongated)



TC 830

Plastic Seat & Cover With Plastic Hinges (European Std.)



TC 283 SJ

Duroplast Seat & Cover With Metal Hinges, Soft Closing (Elongated)



TC 364

Plastic Seat & Cover With Plastic Hinges (Round)

Available:
TC 365 (Elongated)



TC 505 S

Plastic Seat & Cover With Plastic Hinges (European Std.)



TC 840 SJ

Duroplast Seat & Cover With Metal Hinges, Soft Closing (Elongated)



TC 880 SJ

Duroplast Seat & Cover With Metal Hinges, Soft Closing (European Std.)



TC 950 SJ

Duroplast Seat & Cover With Metal Hinges, Soft Closing (Elongated)



A 2105 QMA

Hand Shower
(3S Soft)



D 1205 QMF

Hand Shower
(3S Massage)



A 1705 E

Hand Shower



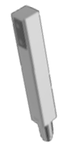
B 250

Hand Shower



A 9A115 XY

Hand Shower



B 255

Hand Shower



A 1505 QMA

Hand Shower
(3S Soft)



A 9A076 G

Hand Shower
(5S Massage)



B 01510

Hand Shower



A 90333

Hand Shower



A 90288

Hand Shower



DH 102 C2V1VJ

Hand Shower



A 9A247 Y

Hand Shower



D 1305

Hand Shower



D 1205 F

Hand Shower



D 0405 QM

Hand Shower
(2S Massage)



D 0405

Hand Shower



D 0400

Hand Shower



A 0705

Hand Shower



S 81028 M

Shower Hanger



A 9A101 ZYR

Shower Hanger



S 81016-2P

Shower Hanger



S 81017 M

Shower Hanger



S 81019 M

Shower Hanger



9A332 Y

Shower Hanger



S 81035 M

Shower Hanger



90915-1 WN

Shower Hanger



TS 11034 V1

Wall Outlet With Hanger



TX 424 SV1

Wall Outlet



TX 472 SESMV1

Wall Outlet



P 40515 W

Shower Hose (Nylon Reinforced)
Length : 1500 mm



P 40012

Shower Hose (Double Interlocking)
Length : 1200 mm

Available:
P 40012-1
(For TX 403 SECR)



P 37909

Shower Hose
(Chromalux Supreme)
Length : 1500 mm



P 40015

Shower Hose
(Double Interlocking)
Length : 1500 mm



P 40815

Shower Hose
(Ultraflex)
Length : 1500 mm



P 40512 PIV

Shower Hose
Length : 1200 mm

Available:
P 40512 W (White)
P 40512 N5 (Black)



P 40512-1 W

Shower Hose
(For TX 403 SEW)
Length : 1200 mm



TX 277 S

Stop Valve With Heavy Duty Flexible Hose

Available:
TX 277 SV1 (Without Flexible Hose)



T 025005

Heavy Duty Flexible Hose (Length: 250 mm)

Available:
T05005 (Length: 500 mm)



TX 434 S

T-Joint



TX 728 AEN

Deck Type Liquid Soap Dispenser (105 mm) (Bottom Refill)

Available:
TX 728 AEV1N (150 mm) (Bottom Refill)
TX 728 AEV4N (70 mm) (Bottom Refill)



TS 126 AR

Deck Type Liquid Soap Dispenser



TS 125 AR

Wall Hung Liquid Soap Dispenser



T 150 NL

Flush Valve Without Vacuum Breaker



TV 150 NSJ

Flush Valve With Vacuum Breaker



TV 150 NWV12J

Flush Valve With Vacuum Breaker



T 60 S

Urinal Flush Valve



T 60 P

Urinal Flush Valve



T 60 RN

Urinal Flush Valve



TX 501 U

Urinal Flush Valve



T 64 CW

Wall Flange With Seal Gasket



T 64 BW

Wall Flange With Seal Gasket



T 53 P 100

Wall Flange With Seal Gasket



TX 215 C

Slip-In Connector



T 82 C 32

Inlet Spud



T 52 S 32 R

Inlet Spud



T 62 - 16

Inlet Spud



T 62 - 16V1

Inlet Spud



THX 3A - 1N

1 1/4" Pop-Up Waste
With Rod Holder



T 6 J1

Waste & Plug

Available:
T 6 JV4



T 6 JV2N

One Push Pop-Up Waste Without
Over Flow Hole



T 6 JV6

One Push Pop-Up Waste With
Over Flow Hole



THX 113 LE

1" Pop-Up Waste For
Console Lavatory



THX 113 LEV1

1" Deluxe Pop-Up Waste For
Console Lavatory



T 53 DSRN

Screws & Caps



T 53 DSN

Screws & Caps



TX 801 LN

Screws & Caps



T 53 DV9

Screws & Fishers



TX 801 C

Wall Mounting Bolts



TSP 0225 W

Bracket



TA 2 SV2

Screws & Caps



T 53 RV1

Caps



THU 079

Wall Flange (For UW 930 J)



TX 253 C

Wall Mounting Bolt & Nut



TA 100 SV1

Screws & Caps



TS 516 DSV3

Fixing Bracket



TS 90261

T-Joint (For UW 930 J)



TU 37 D

Mounting Bolts (For U 370)



T 53 DV5

Screws & Caps (For CW 826 J)



TX 276 C

Fixing Bracket



TX 276 CV1

Fixing Bracket (For CW 421 J)



T 8 C

Straps & Screws



TL 830 GV1

Brackets & Screws (For LW 830 J)



TL 516 G

Brackets With Toggles & Screws



TL 510 ER

Bracket & Screws (For Pedestal)



TX 710 L

Brackets



TX 710 LV4

Brackets



K 9200 L120

Invisible Fixing Kit
(Length: 120 mm)

Available:
K 9200 L150 (Length: 150 mm)
K 9200 L170 (Length: 170 mm)



TX 723 L

Brackets



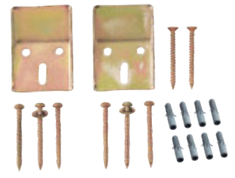
T 9 RA

Hanger & Screws



T 9 R

Hangers & Screws



TL 220 D

Hangers & Screws



TX 809 L

Brackets

Available:
TX 809 LV2 (4 pcs)
TX 809 LV5 (2 pcs)



THX 1A - 8

P-Trap For Lavatory
(H : 95 - 155 mm ; L : 355 mm)

Available:
THX 1A - 8V2 (H : 95 - 155 mm ; L : 306 mm)
THX 1A - 8V3 (H : 42 mm ; L : 355 mm)
THX 1A - 8V4 (H : 42 mm ; L : 306 mm)
THX 1A - 8V5 (H : 82 mm ; L : 355 mm)



TX 709 AN

Plug & Chain Waste With P-Trap
(214 mm)

Available:
TX 709 AV1N (262 mm)
TX 709 AV7 (262 mm)



THX 1A - 3N

P-Trap For Lavatory (260 mm)

Available:
THX 1A - 5N (306 mm)
THX 1A - 6N (350 mm)



THX 1B - 1N

P-Trap For Bidet (288 mm)

Available:
THX 1B - 2N (308 mm)
THX 1B - 3N (358 mm)



S 71

Tooth Brush Holder



S 72

Soap Dish



TX 10 AEZ

Shower Room Door Handle
With Towel Bar
Size : 500 mm



TX 10 AQ

Shower Room Door Handle
With Towel Bar
Size : 500 mm



TX 10 AES

Shower Room Door Handle
With Towel Bar
Size : 500 mm



TX 7

Retractable Clothes Line



TS 118 WSB

Double Robe Hook



TX 6 A1

Curtain Rod
Size : 1524 mm

Available:
TX 6 A2 (1829 mm)
TX 6 A3 (2100 mm)
TX 6 A4 (2400 mm)



TX 10 A

Shower Room Door Handle
Size : 200 mm



TX 10 B

Shower Room Door Handle
With Towel Bar
Size : 500 x 200 mm



TX 1 AN

Floor Drain
Ø : 100.2 mm



TX 1 AV1N

Floor Drain
Ø : 100.2 mm



TX 1 CV2

Floor Drain With Mosquito Trap
Size : 131 x 131 mm



TX 1 BN

Floor Drain With Square Flange
Size : 115 x 115 mm



TX 1 BV1N

Floor Drain With Square Flange
Size : 115 x 115 mm



TX 716 AW

Heavy Duty Mirror
Ø : 600 mm



TX 717 AW

Heavy Duty Mirror
Size : 650 x 500 mm



TX 718 AW

Heavy Duty Mirror
Size : 600 x 750 mm



TX 719 AW

Heavy Duty Mirror
Size : 450 x 600 mm



TS 119 AS5

Heavy Duty Mirror
Size : 455 x 608 mm

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Aksesoris

NOK RATU



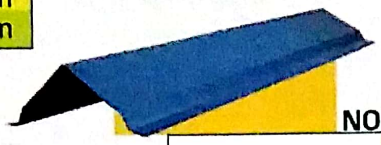
PJ. EFEKTIF	800 ± 10 mm
LEBAR KAKI	220 ± 10 mm
TINGGI	90 ± 5 mm

NOK RAJA



PJ. EFEKTIF	900 ± 10 mm
LEBAR KAKI	320 ± 10 mm
TINGGI	140 ± 5 mm

NOK SULTAN



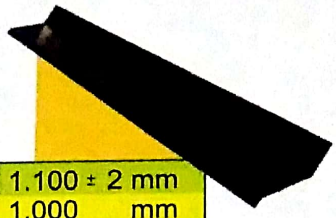
PANJANG	914 ± 2 mm
PJ. EFEKTIF	800 ± 2 mm
LEBAR KAKI MIRING	160 ± 2 mm
TINGGI	80 mm

NOK PUTRI



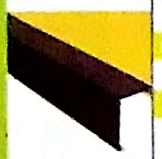
PJ. EFEKTIF	1.050 mm
LEBAR KAKI	120 ± 2 mm
TINGGI	80 ± 2 mm

NOK WF



PANJANG	1.100 ± 2 mm
PANJANG EFEKTIF	1.000 mm
LEBAR	95 ± 2 mm
TEKUKAN ATAS	65 ± 2 mm
TEKUKAN BAWAH	20 ± 2 mm
SUDUT TEKUKAN	140° ± 2°

NOK S



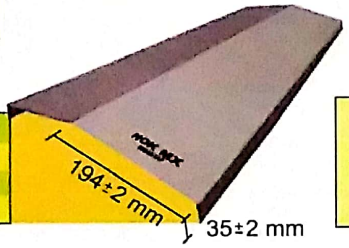
PANJANG	1.100 ± 2 mm
PJ. EFEKTIF	1.000 mm
LEBAR	80 ± 2 mm
TINGGI	100 ± 2 mm
KAIT ATAS/ BAWAH	22,5 ± 2 mm

NOK FANCY



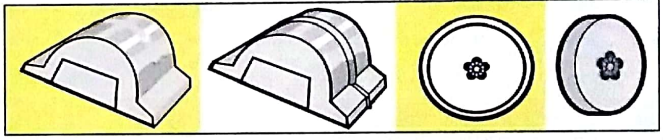
PANJANG	1.090 ± 2 mm
PJ. EFEKTIF	1.030 ± 2 mm
LEBAR	245 ± 2 mm
TINGGI	90 ± 2 mm

NOK MX



PANJANG	2.500 / 4.000 2 mm
PJ. EFEKTIF	2.400 / 3.900 ± 2 mm
LEBAR	365 ± 2 mm
TINGGI	100 ± 2 mm

TUTUP NOK



TASO®

KASO METAL

PAS TEBALNYA..PASTI KUAT!

TOP BRAND 2015-2018



TASO

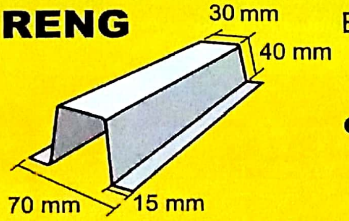
Bahan: Zinc Aluminium AZ 100 G550



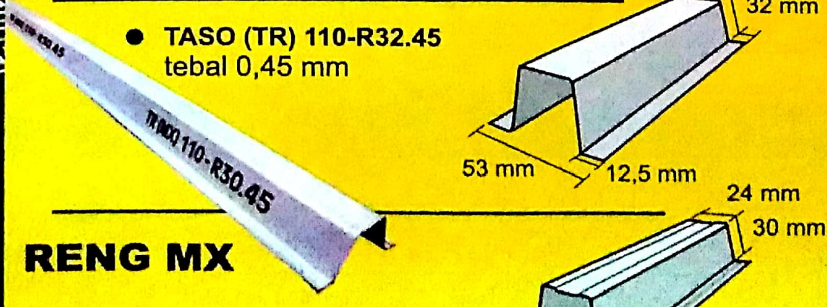
- **TASO (TS) 150-C75.65** tebal 0,65 mm (TCT)
- **TASO (TS) 150-C75.75** tebal 0,75 mm (TCT)
- **TASO (TS) 150-C75.80** tebal 0,80 mm (TCT)
- **TASO (TS) 150-C75.100** tebal 1,00 mm (TCT)

RENG

Bahan: Zinc Aluminium AZ 100 G550



- **TASO R.40.45**
  tebal 0,45 mm



- **TASO (TR) 110-R32.45**
  tebal 0,45 mm

RENG MX

- **TR (MX) 110-R30.45**
  tebal 0,45 mm

BRAKET L

bahan: Galvanis
tebal: 1,5 mm

SCREW TASO

Screw Truss 12 - 14 x 20
Screw Reng 10 - 16 x 16

TALANG JURAI DALAM

Bahan: Zinc Aluminium AZ 100



CV.GEMILANG JAYA TRUSS SPESIALIS KONTRUKSI RANGKA ATAP BAJA RINGAN
Sedia : RANGKA BAJA RINGAN ZINCALUM SNI BERIKUT PEMASANGAN - GENTENG ROOF
OFFICE : Jln. Raya Kedu Parakan Ngijingan No. 18 Temanggung
Telp.(0293) 5526265

SURAT PERNYATAAN DUKUNGAN

NO : 011/SPDBR/TMG/2019

Ditujukan Kepada Yth :

Pengadaan Pekerjaan Kontruksi Pembuatan Jembatan Penghubung Gedung A dan Gedung H Falkutas Hukum Universitas Diponegoro Semarang

Kami yang bertanda tangan dibawah ini:

Nama	: Sopian
Jabatan	: Direktur Utama
Bertindak untuk/atas nama	: CV. Gemilang Jaya Truss
Alamat	: Jl. Raya Kedu Parakan,Ngijingan No.18 Kedu Temanggung
Telp	: 082180446944

Sehubungan dengan adanya pekerjaan :

"PEMBUATAN JEMBATAN PENGHUBUNG GEDUNG A DAN GEDUNG H FALKUTAS HUKUM UNIVERSITAS DIPONEGORO SEMARANG"

Dengan ini kami CV. Gemilang Jaya Truss Mendukung sepenuhnya kepada :

Nama Perusahaan	: CV. BAROKAH JAYA
Nama Pimpinan	: MAS'UD AZIZI
Alamat	: Lingk.Daleman Asri RT.003 RW.004 Mungseng Temanggung
Telp	: 082138758584/085640552205

Dukungan produk tersebut meliputi :

- **Gypsum Board** : **ketebalan 9mm (JAYA BOARD)**
- **Rangka Hollow Aluminium** : **ukuran 40 x 20 x 0,8mm**
- **Kawat Penggantung Rangka** : **Ø 6mm**
  Suspension Hanger Spring adjusted
- **Calciboard** : **ketebalan 9mm (JAYA BOARD)**
- **Rangka sama dengan Gypsum**
- **Kaca Bening dan Kaca Flat Glass Rayband** **(ASAHMAS)**

Jika CV. BAROKAH JAYA yang ditunjuk sebagai pelaksana pekerjaan kontruksi "PEMBUATAN JEMBATAN PENGHUBUNG GEDUNG A DAN GEDUNG H FALKUTAS HUKUM UNIVERSITAS DIPONEGORO SEMARANG" oleh pengguna barang/jasa dengan suatu surat penunjukan maka kami sanggup melaksanakan pekerjaan sebagai Subkontraktor dan memenuhi ketentuan yang telah ditetapkan sebagaimana Dokumen Pengadaan sebagai berikut: 1.Menjamin penuh atas ketersediaan barang pada saat pelaksanaan pekerjaan
2.Menjamin Garansi atas barang yang kami dukung selama 10 Tahun
3.Menjamin bahwa instalasi/pemasangan sesuai standar dan ketentuan yang ditetapkan
4.Sanggup menyediakan tenaga tekhnis/ahli/aplikator yang akan kami dukung.

Demikian Surat Pernyataan Dukungan ini dibuat untuk dapat dipergunakan sebagaimana mestinya.

Temanggung , 20 MEI 2019

CV GEMILANG JAYA TRUSS



Direktur Utama

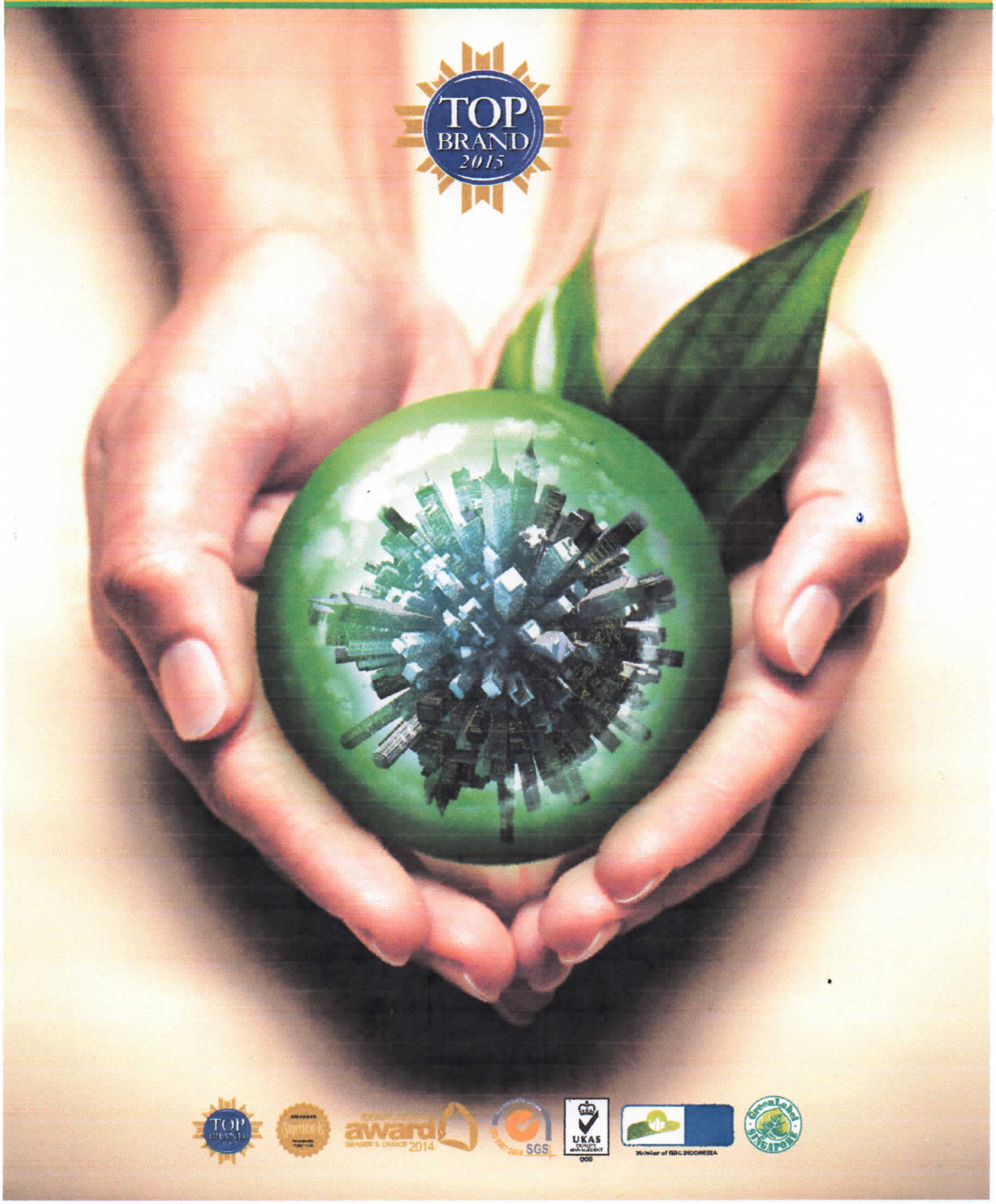
jayaboard®

Pertama & Terbaik di Indonesia!

USG BORAL
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EDISI TERBARU dari PRODUK TERBAIK!

Mei 2016



jayaboard® SHEETROCK BRAND TECHNOLOGY

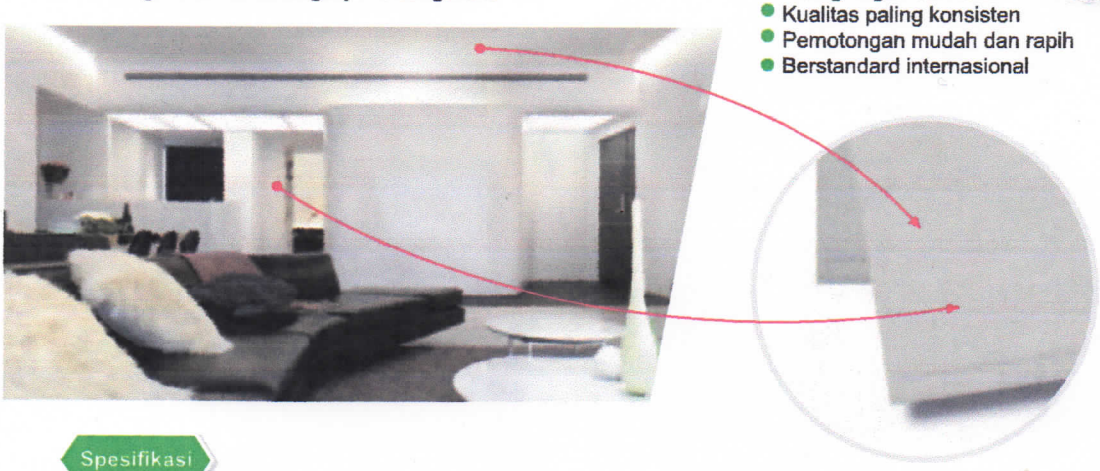
Solusi Terbaik untuk Finishing Gipsum

Mengapa jayaboard SHEETROCK BRAND

Papan gipsum **Jayaboard standard board** merupakan pilihan papan gipsum tipe standard. Produk tipe ini paling banyak dan umum digunakan di berbagai jenis bangunan.

Keunggulan

- Paling tahan lendut
- Paling ringan dan kuat
- Kualitas paling konsisten
- Pemotongan mudah dan rapih
- Berstandard internasional



Spesifikasi

Tebal (mm)	Lebar (mm)	Panjang (mm)	Berat (Kg/m2)
6,5	1200	2400	4,0
9	1200	2400	5,4
12	1200	2400	7,0

Aplikasi

- Partisi dan plafon
- Pelapis dinding
- Partisi dan plafon lengkung
- Ornamen estetis

soundstop

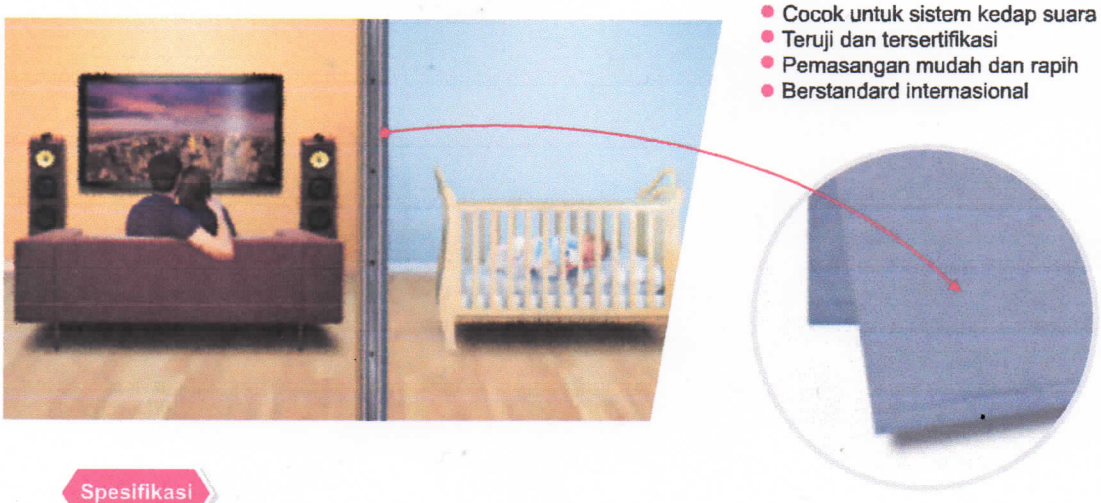
Solusi Terbaik untuk Dinding Kedap Suara

Mengapa soundstop?

Soundstop merupakan papan gipsum terbaru dari USG Boral Indonesia yang memiliki kemampuan yang sangat baik dalam meredam suara agar suara bising yang dihasilkan dari dalam sebuah ruangan, seminimal mungkin bisa tembus ke ruangan yang lain.

Keunggulan

- Cocok untuk sistem kedap suara
- Teruji dan tersertifikasi
- Pemasangan mudah dan rapih
- Berstandard internasional



Spesifikasi

Tebal (mm)	Lebar (mm)	Panjang (mm)	Berat (Kg/m2)
12	1200	2400	11,5

Aplikasi

- Partisi kedap suara (Bioskop, Hotel, Apartemen, Home Theatre)
- Pelapis dinding

firestop

Papan Gipsum Tahan Api

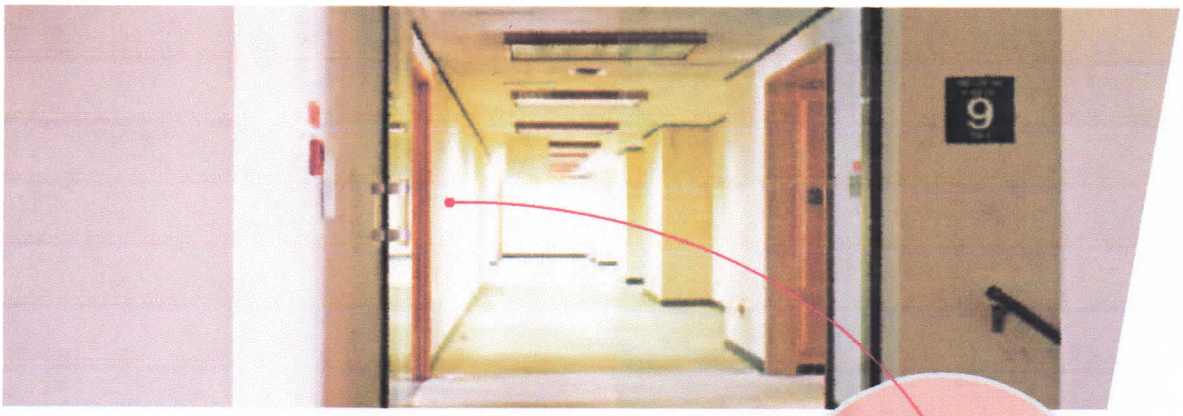
Mengapa *firestop* ?

Firestop adalah papan gipsum yang secara khusus dibuat untuk mendukung sistem ketahanan api untuk partisi dan plafon.

Firestop mengandung *vemiculite dan fiber glass* pada lapisan dalamnya yang membuat papan ini lebih kuat dan tahan terhadap api.

Aplikasi Proyek

- Rumah Sakit
- Hotel
- Apartment
- Ruang Server
- Pabrik
- Perpustakaan



Keunggulan

- Ideal untuk lapisan dinding partisi, plafon, pilar, baik pada bangunan tempat tinggal maupun komersial yang memerlukan sistem ketahanan api yang baik
- Tahan api hingga 3 jam
- Mendukung sistem partisi kedap suara dan tahan gempa

Mengapa *wet-area firestop* ?

Wet-area Firestop adalah papan gipsum yang tidak hanya dapat menahan kondisi lembab dalam ruangan, tetapi juga dapat mendukung sistem tahan api.

Sistem papan gipsum seperti ini sangat ideal digunakan pada ruangan khusus yang cenderung lembab dan harus bebas dari api, seperti ruangan server ataupun dapur.

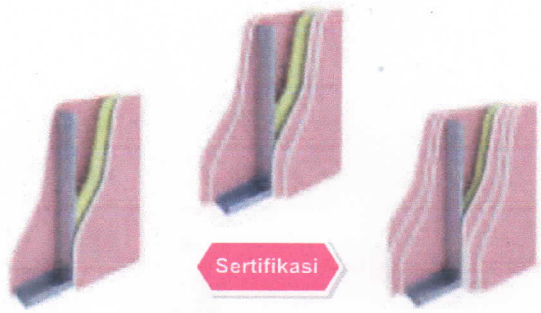
Spesifikasi

firestop

Tebal (mm)	Lebar (mm)	Panjang (mm)	Berat (Kg/m2)	Tahan Lembab
13	1200	2400	10,5	-
16	1200	2400	13	-

wet-area firestop

Tebal (mm)	Lebar (mm)	Panjang (mm)	Berat (Kg/m2)	Tahan Lembab
13	1200	2400	10,5	✓
16	1200	2400	13	✓

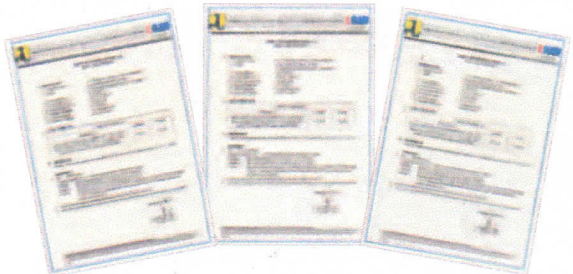


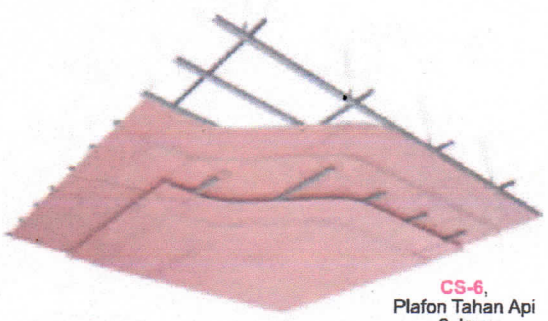
Sertifikasi

SS-5, Partisi Tahan Api 1 Jam

SS-2, Partisi Tahan Api 2 Jam

SS-22, Partisi Tahan Api 3 Jam





CS-6, Plafon Tahan Api 2 Jam

heatstop
Papan Gipsum Tahan Panas

Mengapa *heatstop* ?

Papan gipsum yang telah dilapisi *metalized film* khusus untuk menahan dan memantulkan kembali panas yang dihasilkan sinar matahari!





Membuat ruangan tetap **dingin** dan **nyaman!**

Keunggulan

- Hemat energi (menjaga suhu ruangan/lebih cepat dingin)
- Hemat waktu pemasangan
- Desain rapi dan praktis
- Dapat diaplikasikan pada konstruksi kayu dan rangka metal (furring channel maupun metal stud)
- Ramah lingkungan

Garis⊕
Inovasi **Garis Sekrup,** satu-satunya di Indonesia!

Spesifikasi

Tebal (mm)	Lebar (mm)	Panjang (mm)	Berat (Kg/m^2)
9	1200	2400	5,5
12	1200	2400	7,0

Fungsi dan Rekomendasi

Dilapisi *metalized film* yang khusus untuk menahan dan memantulkan kembali panas yang dihasilkan sinar matahari hingga 90% apabila digunakan sebagai plafon dengan standar internasional (JIS R3 106)
Lapisan *metalized film* juga akan membantu menahan uap air hasil kondensasi apabila digunakan sebagai partisi sehingga bagian dalam partisi tetap kering dan ruangan tetap dingin.

moldstop
Papan Gipsum Tahan Jamur

Mengapa *moldstop* ?

Mengapa harus Moldstop

- Tahan jamur sesuai standard international ASTM G-21 (Grade 0)
- Tahan lendut (Max 90% RH)
- Pemasangan mudah dan rapih
- Kualitas konsisten





Garis⊕
Inovasi **Garis Sekrup,** satu-satunya di Indonesia!

Fungsi dan Rekomendasi

- Mengandung bahan anti jamur khusus untuk mengurangi resiko tumbuhnya jamur pada permukaan papan gipsum.
- Direkomendasikan untuk ruangan dengan kebutuhan perlindungan jamur, kesehatan dan kenyamanan.
- Cocok untuk pemasangan partisi, plafon ataupun pelapis dinding (pengganti plaster aci semen)

Spesifikasi

Tebal (mm)	Lebar (mm)	Panjang (mm)	Berat (Kg/m^2)
9	1200	2400	5,5
12	1200	2400	7,0

jayabms

Solusi Terbaik Rangka Plafon & Partisi Gipsum

Mengapa *jayabms?*

Jayabms adalah solusi sistem rangka partisi dan plafon gipsum yang dikembangkan sebagai solusi terbaik oleh USG Boral Indonesia. **Jayabms** dirancang dan dikembangkan untuk bisa memenuhi berbagai kebutuhan desain & spesifikasi proyek.

jayafurring

Sistem rangka plafon yang sesuai untuk diaplikasikan pada proyek luxurious dengan area plafon lebih dari 100m² atau bentang bebas lebih dari 10m.

- Safety Factor min 3X
- Bergaransi Tahan Api
- Luas Area Plafon >100 m²
- Performa Heavy Load Duty

CS-18fc
Sistem Plafon Standard
Furring Channel



Cocok Untuk
- Industrial
- Pusat Perbelanjaan
- Gedung Peribadatan
- Auditorium Hall
- Ruang Tahan Api

Easy Frame

Sistem rangka plafon optimal yang sesuai untuk diaplikasikan pada area plafon hingga 100m² atau bentang bebas hingga 10m.

- Safety Factor min 3X
- Jayaboard 9mm & Mini 9
- Luas Area Plafon hingga 100 m²
- Rp Biaya Optimal

CS-20
Sistem Plafon
Standard **Easy Frame**



Cocok Untuk
- Apartment
- Sekolah
- Rumah Tinggal
- Ruko dll.

Cjaya

Solusi ekonomis sistem rangka berkualitas yang sesuai untuk luas area plafon hingga 50m² atau bentang bebas hingga 7m.

- Safety Factor min 3X
- Jayaboard 9mm & Mini 9
- Luas Area Plafon hingga 50 m²
- Rp Ekonomis

CS-21
Sistem Plafon
Standard **Cjaya**



Cocok Untuk
- Rumah Tinggal
- Apartment
- Ruko

sistem partisi

Aplikasi

- Ruang tahan api
- Apartment
- Hotel
- Kantor
- Pabrik



Keunggulan

- Cepat & mudah
- Tahan api
- Tahan karat/premium
- Ringan
- Konstruksi kering & bersih

USG Donn Grid



DONN® DX I
Suspended Ceiling System



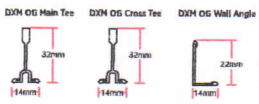


DONN® DX II
Suspended Ceiling System





DONN® DXM OMEGA
Suspended Ceiling System





DONN® DXT NARROW FACE
Suspended Ceiling System



Keunggulan

- Pemasangan mudah & cepat
- Kualitas konsisten
- Koneksi kuat & presisi
- Bongkar pasang mudah & tanpa alat
- Sistem tahan gempa

Kualitas Konsisten

Jayabms memproduksi setiap rangkanya dengan material baja ringan & *coating* pilihan. Dikombinasikan dengan desain profil produk untuk mencapai kemampuan mekanik yang sesuai standard internasional.

Aplikasi Mudah dan Cepat

Setiap solusi sistem rangka plafon & partisi jayabms didesain dan dikembangkan untuk mencapai tingkat kemudahan dan kecepatan aplikasi bagi pelanggan.

Kuat dan Aman

Jayaboard menempatkan *Safety Factor* sebagai prioritas dalam mengembangkan produk. Pengujian berkala dilakukan untuk memastikan tingkat keamanan dan kualitas produk yang sesuai dengan standard internasional.

Bergaransi

Jayabms menyediakan solusi sistem yang lengkap dan *Full System*. Untuk memastikan kenyamanan pengguna, tersedia Garansi Produk & Sistem untuk setiap pemasangan yang mengikuti sistem rekomendasi.

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INNOVATION INSPIRED BY YOU.

jayaboard®





Sag-Defying Strength

bebas lendut hingga pemasangan

60 cm

- Teknologi kekuatan anti-lendut
- Lebih ringan tanpa mengurangi performa
- Bagian tepi lebih kuat
- Kekuatan inti yang konsisten

Hotline 021-797 7777 **www.usgboral.com**

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ANTI BAKTERI
PRODUK BARU
& TAHAN JAMURI

jayapanel Gyptile

Antimicrobial Moldstop

Antimicrobial Moldstop adalah ceiling panel dengan performa antimicrobial dan tahan jamur. Produk ini sesuai untuk digunakan pada rumah sakit maupun ruang-ruang lain yang memerlukan performa antimicrobial.

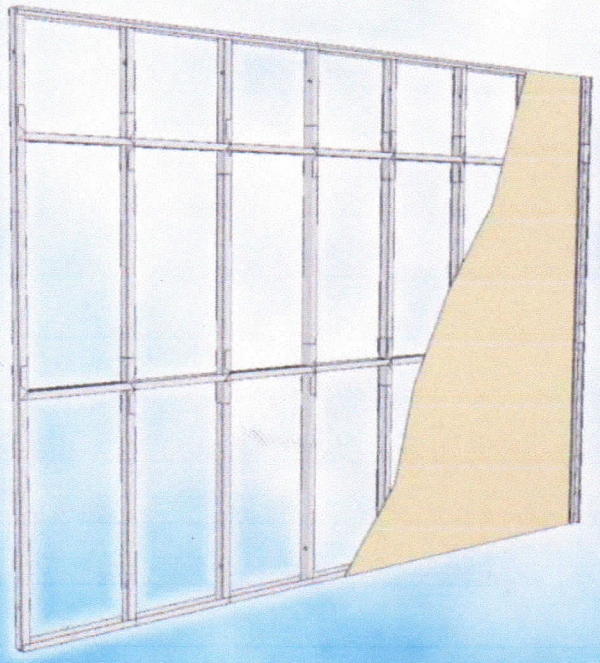


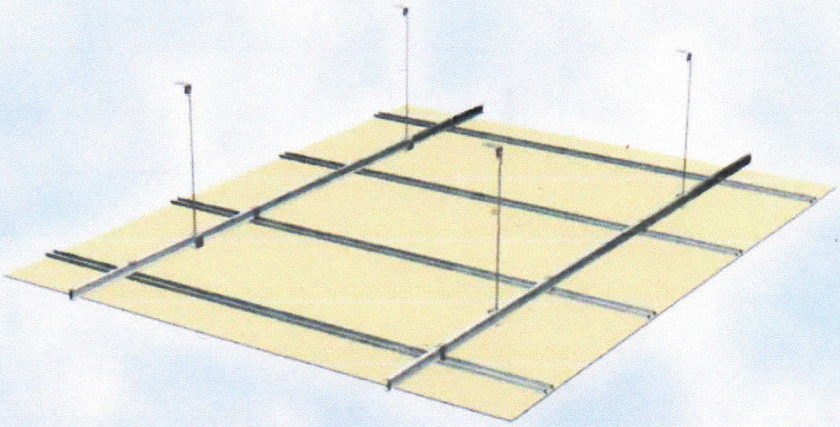


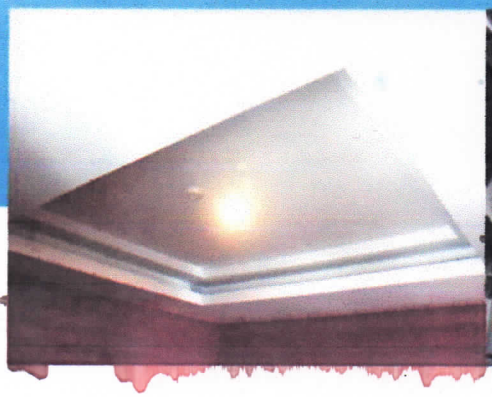
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JSTEEL®

rumah prefab | penutup atap | rangka atap | rangka dinding | rangka lantai | rangka plafon | kusen











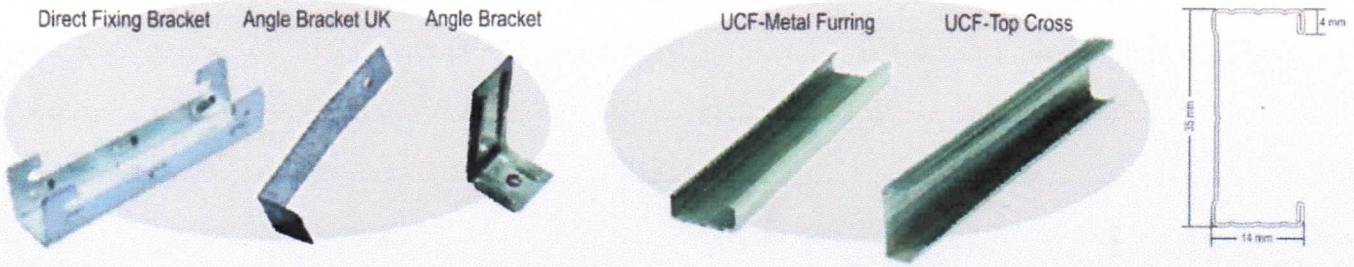
RANGKA PLAFON
Universal Ceiling Frame
& RANGKA PARTISI

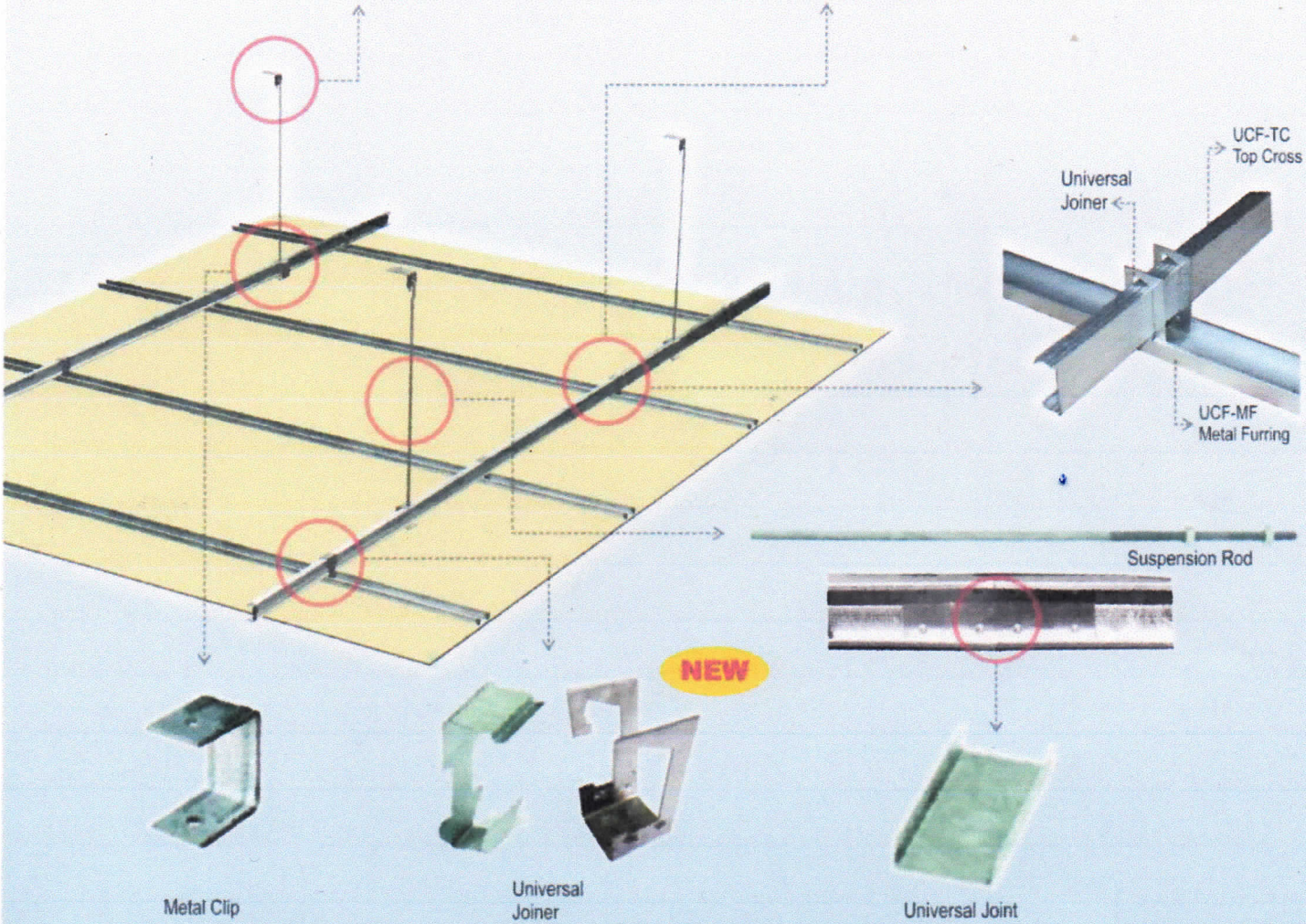
RANGKA PLAFON

SPESIFIKASI
Memadukan 2 elemen utama profil Metal Furring dan Top Cross dalam satu bentuk :
Universal Ceiling Frame (UCF)

Material :
Galvalume AZ-150,
t = 0.45 mm TCT & 0.50 mm TCT

Universal Ceiling Frame



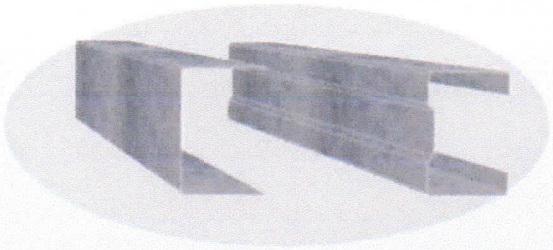


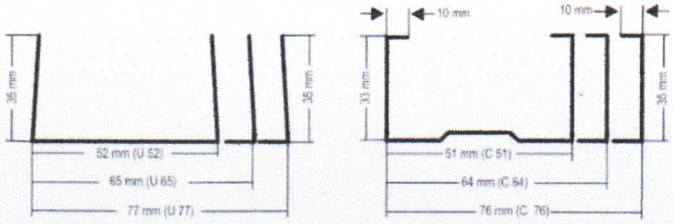


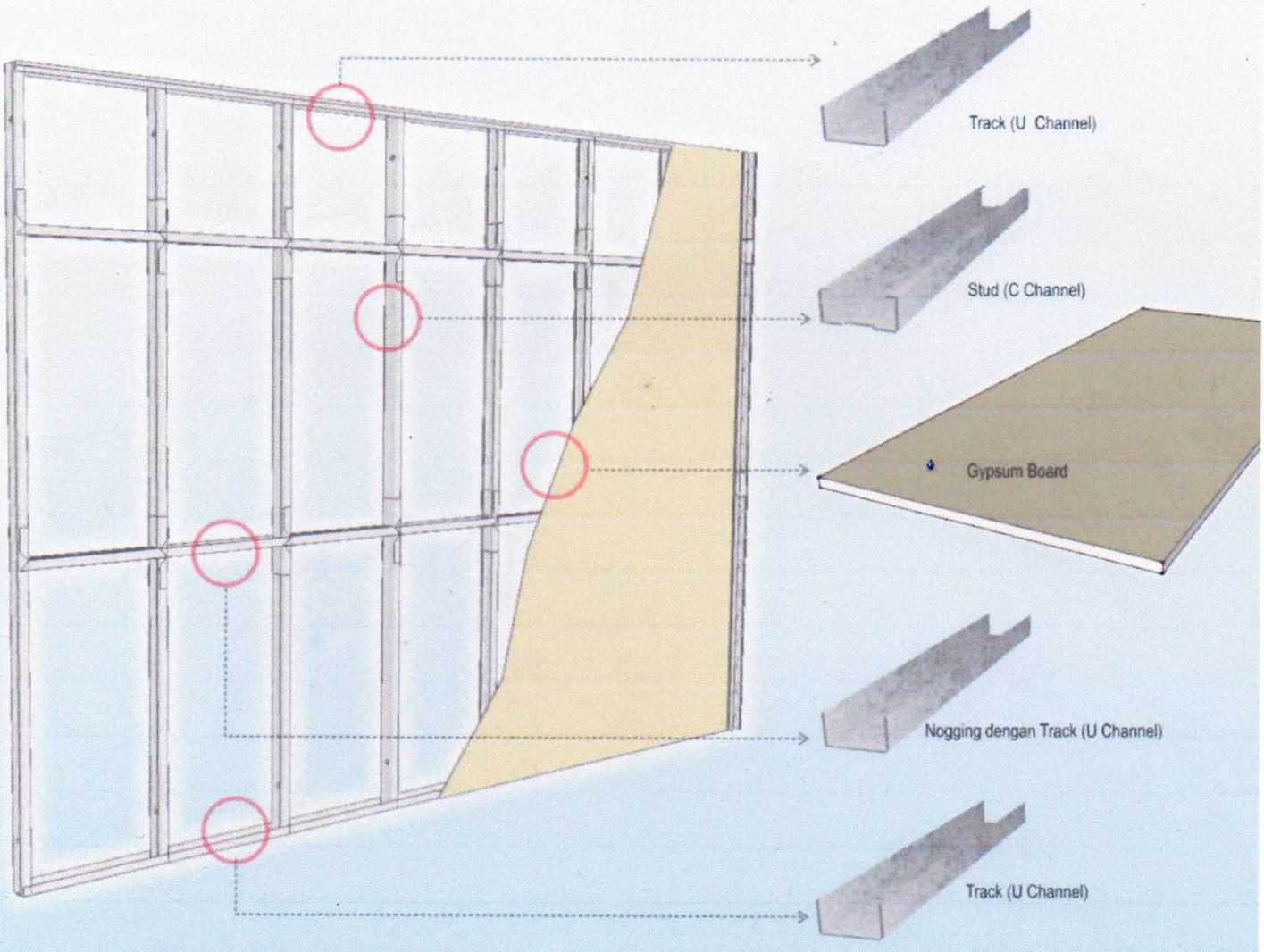
RANGKA PARTISI

SPESIFIKASI
C – STUD & U – TRACK
Fungsi :
Sekat Ruang = Non-Load Bearing Wall

Material :
Galvalume AZ-150,
t = 0.40 mm TCT & 0.50 mm TCT









Keuntungan Mengunakan Rangka Plafon dan Rangka Partisi JSteel

Presisi
Presisi dalam bentuk dan ukuran. Itu membuat pemasangan rangka plafon dan partisi baja ringan JSteel lebih mudah dan cepat.

Keseragaman Kualitas Material
Material Galvalume (AluZinc) dan Galvanized memiliki keseragaman (baik ketebalan, lapisan pelindung maupun kuat tarik bahan) dibandingkan dengan kualitas material lain yang ada di pasaran.

Deformasi
Deformasi relatif kecil. Perubahan temperatur yang ekstrim pada rangka baja ringan akan mengakibatkan deformasi yang relatif kecil dibandingkan dengan rangka kayu, karena sifat-sifat mekanik dan kekuatan yang dimiliki oleh material Galvalume atau Galvanized.

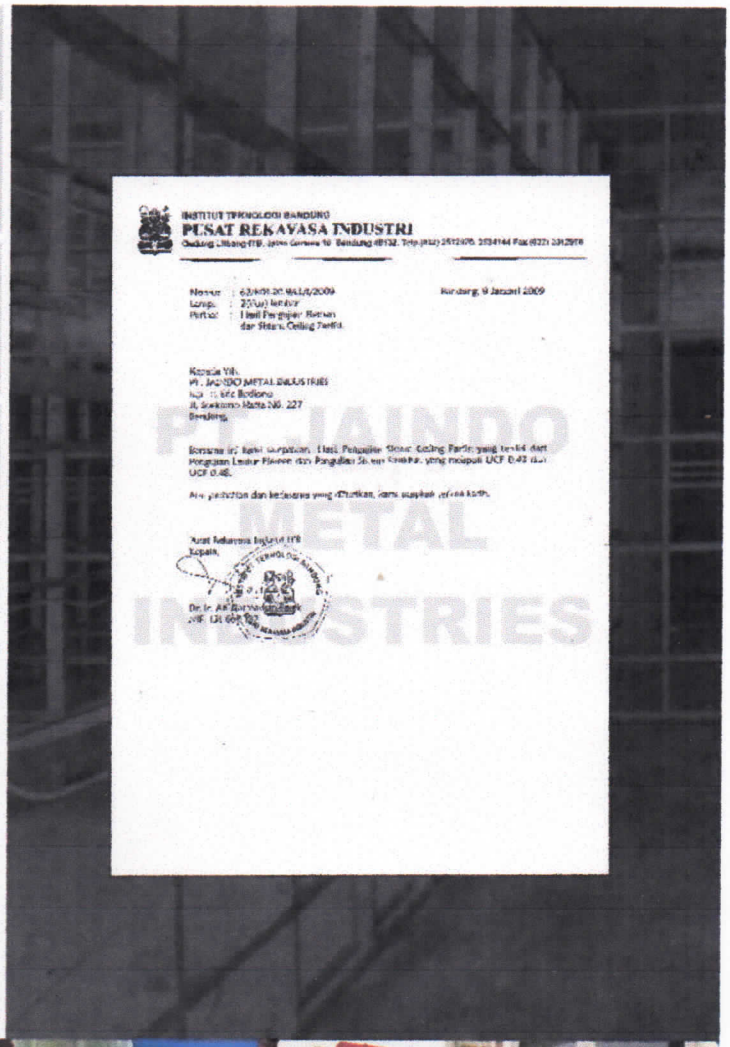
Tahan Api
Kebakaran merupakan kecelakaan yang paling sering terjadi terhadap bangunan. Baja merupakan material yang lebih tahan terhadap api dibandingkan kayu

Anti Rayap
Dapat kita bayangkan jika tiba-tiba bangunan atau tempat tinggal yang menggunakan rangka kayu konvensional roboh tanpa sebab yang jelas. Itu bukan gempa bumi, melainkan oleh rayap. Pada kondisi lingkungan tropis, rayap dapat menggerogoti bangunan dari bahan kayu dengan cepat.

Awet dan Ringan
Lapisan pelindung Alumunium dan Zinc pada Galvalume melindungi material dari proses karat. Karena ringan, bahan Galvalume atau Galvanized sangat ideal digunakan sebagai rangka partisi dan rangka plafon

Fleksibilitas
Kebutuhan akan ruang selalu menjadi masalah dari waktu ke waktu. Salah satu keunggulan sistem rangka partisi JSteel dari sistem rangka partisi konvensional, adalah fleksibilitas bongkar pasangnya.

Kesimpulan Pengujian Rangka Plafon


INSTITUT TEKNOLOGI BANDUNG
PUSAT REKAYASA INDUSTRI

Bandung, 9 Januari 2009

Kepada Yth.
PT. JAINDO METAL INDUSTRIES
Jl. Soekarno Hatta No. 227
Bandung

PT. JAINDO METAL INDUSTRIES


Pengujian di Laboratorium ITB

PT. JAINDO METAL INDUSTRIES

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ASAHIMAS
AGC Group

ARCHITECTURAL GLASS





AGC Group

Profil Perusahaan

Company Profile

Nama Perusahaan	**PT Asahimas Flat Glass Tbk**	*Company Name*
Status	**PMA (Penanaman Modal Asing)** *Foreign Investment Company*	*Status*

Alamat Kantor / Pabrik — *Address of Head Office / Factory*

JAKARTA	SURABAYA	CIKAMPEK
Jl. Ancol IX No.5 Ancol Barat Jakarta 14430, Indonesia Phone : +62 - 21 - 6904041 (8 lines) Fax : +62 - 21 - 6918709, 6900470 PO BOX : 4344/JKT F	Desa Tanjung Sari, Kecamatan Taman Kabupaten Sidoarjo, 61257 Jawa Timur, Indonesia Phone : +62 - 31 - 7882383 (4 lines) Fax : +62 - 31 - 7882842, 7882149 PO BOX : 1481/SBY 60014	Bukit Indah Industrial Park (BIIP) Sektor 1 A Blok J-L, Cikampek 41373 Jawa Barat, Indonesia Phone : +62 - 264 - 351711 (8 lines) Fax : +62 - 264 - 351710

Luas Area	**112.5 Ha**	*Total Area*

Perkembangan Produksi — *Production Activity*

Tungku I Jakarta (Proses Fourcault)
Pembangunan : Januari 1972
Mulai Produksi : 26 April 1973

Jakarta Tank Furnace I (Modified FourCault Process)
Construction : January 1972
Start Production : April 26, 1973

Tungku II Jakarta (Proses Fourcault)
Pembangunan : Oktober 1976
Mulai Produksi : November 1977

Jakarta Tank Furnace II (Modified FourCault Process)
Construction : October 1976
Start Production : November 1977

Tungku III Jakarta (Proses Float)
Pembangunan : April 1981
Mulai Produksi : Januari 1983

Jakarta Tank Furnace III (Modified Float Process)
Construction : April 1981
Start Production : January 1983

Tungku IV Jakarta (Proses Float)
Pembangunan : Oktober 1990
Mulai Produksi : Februari 1993

Jakarta Tank Furnace IV (Modified Float Process)
Construction : October 1990
Start Production : February 1993



AGC Group

Pendahuluan
Preface

Keberadaan kaca sebagai bahan bangunan telah dikenal dan digunakan sejak dibutuhkannya bidang transparan yang mampu menyatukan ruang luar dengan ruang dalam serta memasukan unsur pencahayaan alami namun tetap menjaga kondisi ruang dalam dari pengaruh ruang luar.

Glass is well known as one of the integral building material, one that can blend interior with exterior, and the same time keeps the two apart.

PT Asahimas Flat Glass Tbk. sebagai perintis industri kaca di Indonesia sejak 1973, telah ikut serta aktif dalam memenuhi kebutuhan diatas sesuai dengan lajunya pembangunan di Indonesia.

PT Asahimas Flat Glass Tbk. is the pioneer of the Indonesian glass industry which was established in 1973. The company is proud to do its share in the role of stimulating Indonesian development.

Sejarah kaca

Pembuatan kaca sendiri berawal dari daerah sekitar Mesopotamia, 7 ribuan tahun yang lalu. Benda-benda terbuat dari kaca banyak ditemukan bersamaan dengan perhiasan mewah yang terbuat dari logam mulia dan batu berharga. Sedangkan kaca sebagai bahan bangunan mulai digunakan setelah kaca lembaran dapat dibuat secara massal di Roma, yaitu sekitar tahun 30 sebelum masehi sampai dengan tahun 345 masehi dengan teknik yang disebut sebagai teknik tiup. Meskipun kaca lembaran yang dihasilkan berukuran kecil dan dengan mutu yang kurang baik, namun teknik tiup ini tetap dipakai hingga abad XVII.

History of Glass

Making glass dates back to Mesopotamia, 7.000 years ago. An abudance of glass wares has been found along with jewelleries made of pure gold and precious stones. The use of glass as a building material dates back to ancient Rome about 30 BC to 345 AD. At that time the glass was being blown in to shape. This technique was used for the production of windows only, produced low quality small size sheets, but still this was the method used until the seventeenth century.

Baru pada awal abad XX, teknik ini mengalami mekanisasi sehingga dapat menghasilkan kaca lembaran yang berukuruan lebih besar. Metode berikutnya yang dikembangkan adalah suatu proses dimana cairan kaca yang masih membara ditarik terus menerus dari tungku peleburan melalui sejumlah rol. Kaca lembaran yang dihasilkan dengan metode ini ("Slit Method") memiliki permukaan yang kurang rata dan menyebabkan distorsi terhadap arah pandangan.

The twentieth century saw this technique improve to produce a much larger glass sheet. A subsequent method was the "Slit Method" which had the molten glass being drawn continuously from the furnace through rollers. This produced slightly uneven surface with some distortion.

Mutu ini cukup memadai untuk kaca-kaca jendela, tapi untuk menghasilkan mutu yang lebih tinggi, maka kedua permukaan kaca ini perlu dipoles hingga rata, halus dan mengkilap. Hal ini biasa dilakukan untuk kaca cermin dan berharga sangat mahal.

This is quite acceptable for window glass, but in order to achieve the highest quality of glass, both surfaces of the glass should be polished to achieve perfect flatness, smoothness and shine. This process is only applied to the making of mirrors and quite costly.

Baru pada tahun 1959, Pilkington berhasil menciptakan suatu proses baru yang disebut "Float Process" yang dapat menghasilkan kaca bermutu prima, kedua permukaannya rata sempurna dan bebas distorsi.

In 1959, Pilkington invented the "Float Process" which revolutionized glass making with superb quality for both surface, produced of perfect flatness and free from distortion.

Proses selanjutnya dikembangkan oleh beberapa negara, salah satunya Jepang oleh Asahi Glass Co., Ltd hingga menjadi suatu teknologi pembuatan kaca lembaran yang sempurna dan canggih. Dari Asahi Glass Co., Ltd inilah Indonesia mengenal teknologi pembuatan kaca lembaran dan melalui kerjasama dengan Rodamas Co., Ltd membentuk PT Asahimas Flat Glass, Tbk. sebagai perintis indutri kaca pertama di Indonesia.

Then the float process was developed by other countries such as Japan through Asahi Glass Co., Ltd which turn one technology into perfect and advanced glass sheet manufacturing. Through Asahi Glass Co., Ltd Indonesia acknowledged the technology of glass sheet manufacturing and established a joint venture with Rodamas Co.,Ltd to perform PT Asahimas Flat Glass, Tbk. as the first Indonesia sheet glass industry.



Karakteristik Umum

- Kaca bening hasil proses pengembangan dengan permukaan yang sangat bersih, rata dan bebas distorsi, memberikan tingkat transmisi yang tinggi (lebih dari 90%) serta memberikan bayangan yang sempurna.
- Ketebalan yang dihasilkan mampu hingga 19mm, dengan lebar 3.00 m dan panjang 10 m (disesuaikan dengan kemampuan transportasi-nya).
- Dimensi yang besar dan ketebalan yang bervariasi ini memberikan keleluasaan pada perencana bangunan untuk berkreasi dengan dinding-dinding kaca / bukaan-bukaan besar.

Pemakaian

- Eksterior dan interior pada bangunan, baik untuk rumah tinggal, bangunan umum, perkantoran, pertokoan, bangunan tinggi dan lain-lain.
- Lemari pajang, perabot rumah tangga, table top, dinding dekorasi, aquarium, cermin dan lain-lain.
- Kaca-kaca pengaman dan pemakaian khusus.
- Dinding kaca berbagai jenis, termasuk dinding-dinding yang besar (Suspension Glass System).

Features

- *Transparent float glass, made by the float process, has a high-precision of flatness (smooth surface), free of distortion, fine transmission (above 90%) or perfect images reflection.*
- *Thickness up to 19 mm is possible with width of about 3 m and length of about 10 m (which is sectioned for ease of transportation).*
- *This large dimension allows designers to use their creativity in planning glass wall buildings and wide buildings and wide opening windows.*

Applications

- *Exterior and interior of residential houses, public buildings, offices, shoping malls, skyscrapers, etc.*
- *Showcases, show-windows, cupboards, table tops, decorative friezes, aquariums, mirrors, etc.*
- *Safety glass and special usage.*
- *Many kinds of glass walls, including Suspension Glass System.*

Jenis dan Spesifikasi

Type and Specifications

PRODUCT NAME	TYPES	THICKNESS		Weight (kg/m2)	MANUFACTURING SIZE (inch) Max Standard Size													
		STANDARD (mm)	TOLERANCE (mm)		44x36	48x20	48x24	48x34	50x30	60x48	72x36	72x48	72x52	80x36	80x40	96x72	144x96	120x84
INDOFLOT Clear Float Glass	FL2	2	1.8 - 2.2	5	✓	✓	✓	✓	✓									
	FL3	3	2.8 - 3.2	7						✓	✓	✓						
	FL4	4	3.8 - 4.2	10						✓		✓		✓			✓	✓
	FL5	5	4.8 - 5.2	12						✓		✓	✓	✓	✓	✓		✓
	FL6	6	5.8 - 6.2	15													✓	✓
	FL8	8	7.7 - 8.3	20													✓	✓
	FL10	10	9.7 - 10.3	25													✓	✓
	FL12	12	11.7 - 12.4	30													✓	✓
	FL15	15	14.5 - 15.6	37														✓
	FL19	19	18.2 - 19.4	47														✓





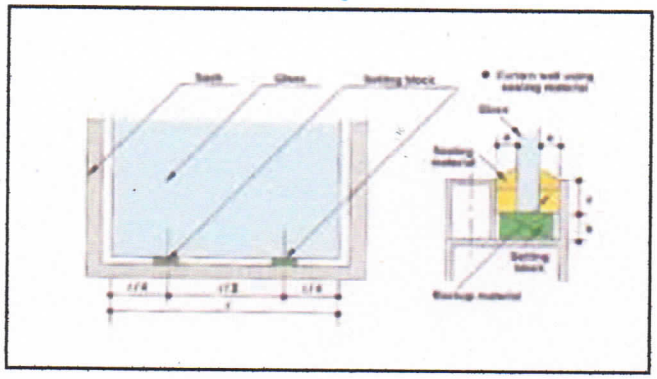
- Gunakan sealant yang benar-benar elastic dan bermutu baik (Polysulfids ; silicons sealant, dll)
- Gunakan backup material yang memiliki tingkat insulasi panas yang tinggi, seperti neopreme, foam dan polyethylene foam
- Gunakan 2 buah setting blocks atau neoprene dengan kekerasan 90° atau lebih pada sisi bawah kaca, dengan ukuran:

  Panjang = (25 x luas kaca dalam m²) mm, max 50 mm
  Lebar = tebal kaca + 5 mm
  Tebal = 5 mm s/d 12 mm

- *Use an elastic sealant of high quality (polysulfide, silicone sealant, etc) as a sealing material.*
- *Use material of high heat insulation back up such as neoprene, foam and polytethylene foam.*
- *Use two setting blocks or neoprene, rubber hardness 90° or above, at the base with dimensions specified belows:*

  Length = (25 x area glass in SQM) mm, max 50 mm
  Width = Glass thickness + 5 mm
  Thickness = 5 mm to 12 mm

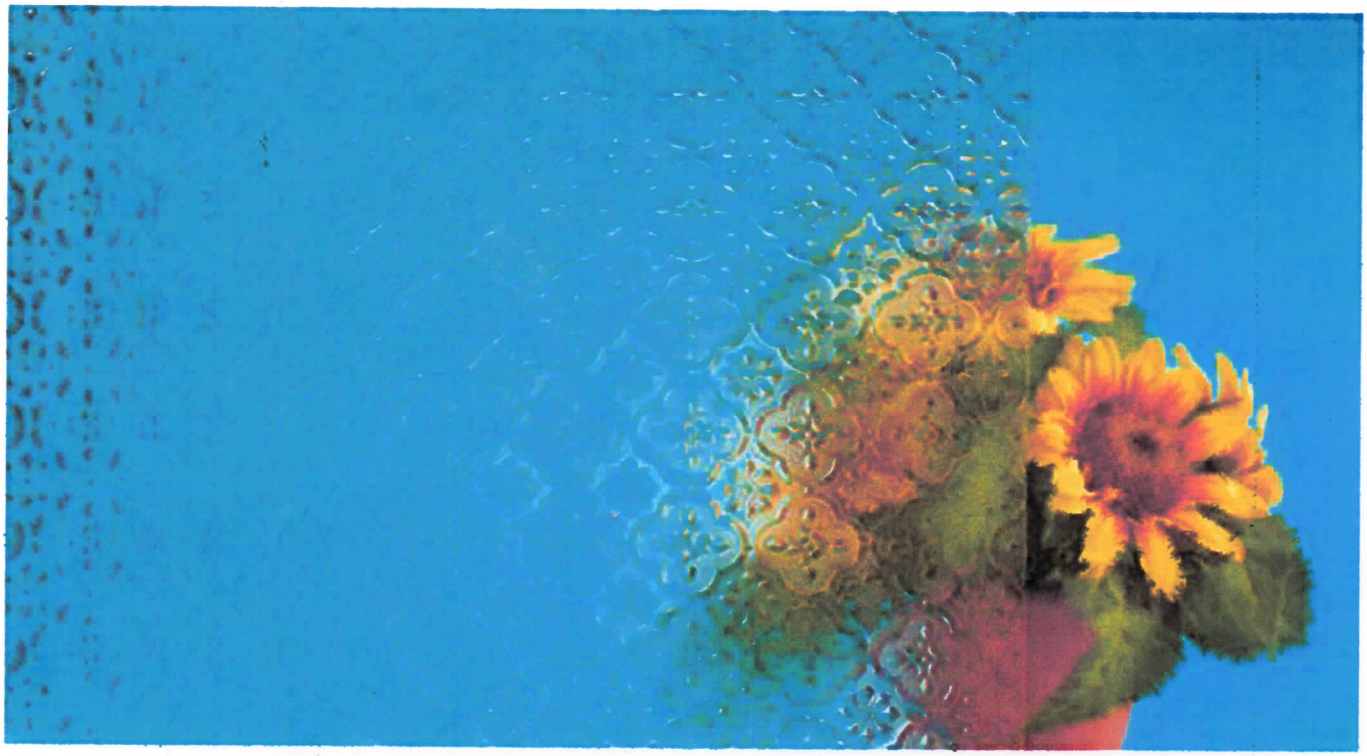
Glazing



Jenis dan Spesifikasi

Type and Specifications

PRODUCT NAME	TYPES		STANDARD THICKNESS (mm)					MANUFACTURING SIZE (mm) STANDARD SIZE						
			3	5	6	8	12	60 x 48 1524 x 1219	72 x 52 1829 x 1321	80 x 36 2032 x 914	80 x 40 2032 x 1016	96 x 72 2438 x 1829	120 x 84 3048 x 2134	126 x 84 3210 x 2134
PANASAP Tinted Float Glass	Panasap Blue Green	BNFL		✓	✓	✓								5, 6, 8
	Panasap Dark Blue	DHFL		✓	✓	✓	✓	5				5		5, 6, 8, 12
	Panasap Euro Grey	GEFL		✓	✓	✓	✓							5, 6, 8, 12
	Panasap Dark Grey	DGFL	✓	✓	✓			3, 5	5	5	5	5	5	6
	Panasap Bronze	BRFL		✓	✓	✓							5, 6, 8	
	Panasap Green	GNFL		✓	✓	✓	✓							5, 6, 8, 12



Karakteristik Umum

- Indofigur dengan polanya yang atraktif dan daya tembus yang terbatas akan memberikan efek dekoratif yang sangat menarik.
- Berkas cahaya yang melalui indofigur akan dibiaskan dengan tingkat pembiasan dan tingkat pembayangan (daya tembus) yang bervariasi. Hal ini memberikan efek pencahayaan dan efek pembayangan yang menakjubkan.
- Khusus indofigur non glare, memiliki kemampuan untuk mereduksi silau secara maksimum.

Penggunaan

- Untuk partisi, dinding, pintu, perabotan rumah, lampu dan lain-lain pada rumah tinggal, kantor, hotel, pertokoan, rumah makan dan bangunan-bangunan komersial dan industrial lainnya yang membutuhkan unsur dekoratif.
- Untuk ruang-ruang dimana cahaya masih diperlukan tapi daya tembus pandang tidak diharapkan, seperti pada ruang kamar mandi.
- Khusus untuk indofigur non glare digunakan untuk bingkai foto/gambar, sehingga dilihat dari sudut pandang manapun gambar tetap jernih tanpa adanya efek silau.

Features

- *Indofigur with its attractive patterns and limited visibility will add to decorative effects and beauty.*
- *Light going through Indofigur will be transmitted at various degrees of diffused light and creates many different atmospheres of light and shade.*
- *Specially for non glare Indofigur it can reduce glare completely*

Applications

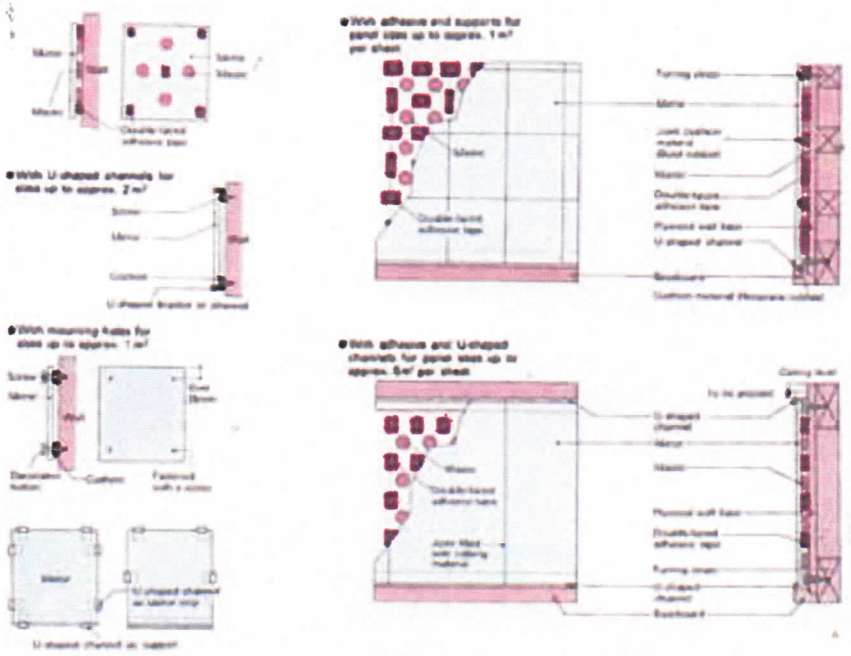
- *Window partitions, screens, doors, furniture, fluorescent fixtures of residence, offices, hotels, shops, restaurants, and all other commercial and industrial buildings where decorations is desirable.*
- *Places where its necessary to let light through but obstruct the line of sight, e.g. bathrooms.*
- *For picture framing, enabling the picture to be seen without reflection from any angle.*

Jenis dan Spesifikasi

Type and Specifications

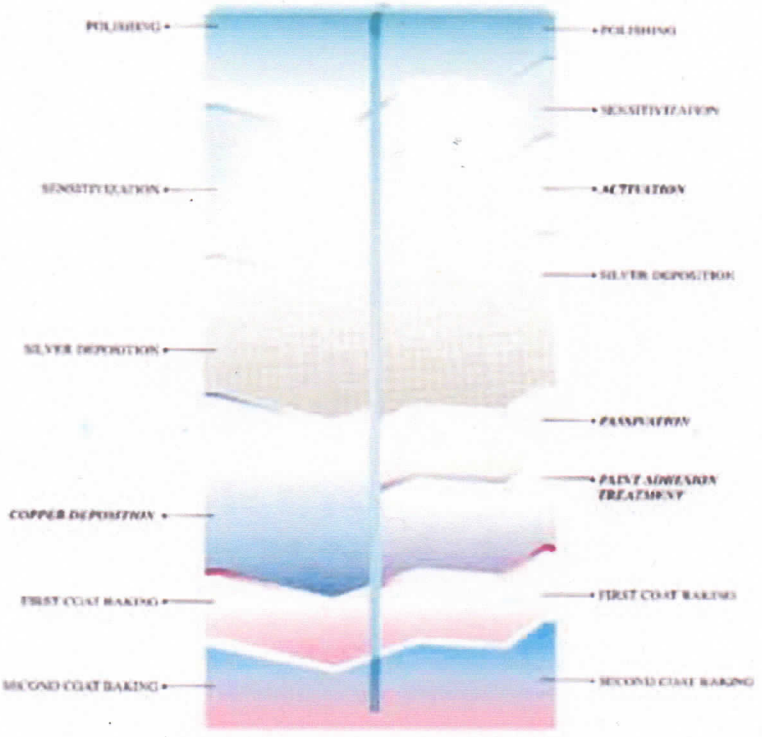
PRODUCT NAME	TYPES		STANDARD THICKNESS (mm)				STANDARD MANUFACTURING SIZE (Inch)				WEIGHT (kg/m²)
			2	3	4	5	44 x 36	60 x 48	72x48	84 x 48	
INDOFIGUR Pattern Glass	Mislite	FM		✓		✓	5	3,5	3,5	5	2 mm = 5
	Flora	FF		✓				3			3 mm = 7
	Non Reflective	NR	✓					2	2		4 mm = 10
	Goldfish	GF		✓				3			5 mm = 12

Glazing For Interior

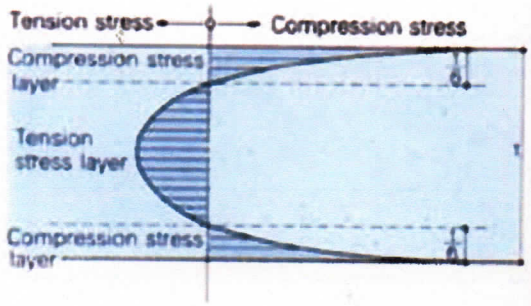


Danta Prima Mirror

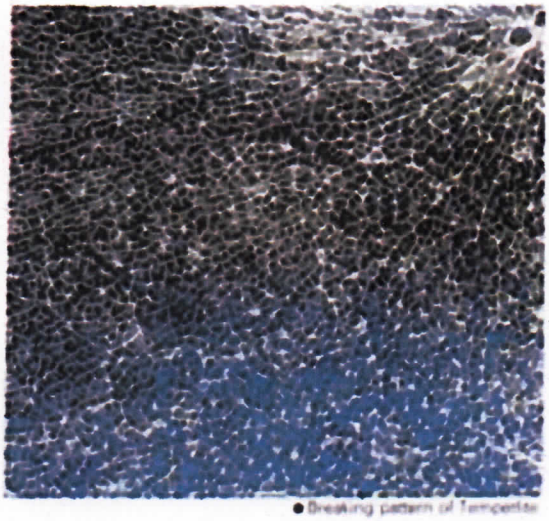
New Generation Mirror



Temperlite Sectional Stress Diagram



(Note) Young's modulus, optical properties, thermal conductivity, hardness, specific heat, specific gravity, and coefficient of linear expansion are same as those of a base glass.



● Breaking pattern of Temperlite

Karateristik Umum

- Dengan ketebalan yang sama, kekuatan kaca tempered mampu mencapai 3 s/d 5 kali lipat dari kekuatan kaca biasa terhadap beban angin, tekanan air, benturan dan sebagainya.
- Terhadap perubahan temperatur yang tinggi dan cepat (thermal shock) maka kaca Tempered memiliki kemampuan 3 kali lebih besar dari kemampuan kaca float biasa.
- Jika pecah, pecahan kaca tempered berbentuk kecil-kecil dan tumpul, sehingga sangat aman bagi manusia (tidak akan melukai manusia).

Penggunaan

- Pintu-pintu bebas rangka
- Bukaan-bukaan/dinding kaca pada bangunan yang menuntut tingkat keamanan tinggi
- Dinding kaca batas tangga, escalator dan lift.
- Furniture dan dekorasi, seperti meja kaca, lemari pajang dan lain-lain
- Kaca-kaca jendela kendaraan bermotor
- Penggunaan-penggunaan lain yang memerlukan kekuatan kaca khusus, seperti untuk dinding lapangan squash dan lain-lain.

Catatan

- Karena kaca tempered memiliki keseimbangan yang baik sekali antara tegangan tekan dengan tegangan tariknya, maka kaca tempered tidak boleh diganggu oleh proses-proses lebih lanjut yang dapat membahayakan keseimbangan tersebut, seperti pemotongan, penggosokan tepi, pembuatan lubang dan lain-lain. Semua ukuran dan jenis aksesoris harus sudah dapat ditentukan dengan pasti sebelum kaca Tempered diproses.

Features

- *On the same thickness tempered glass has bending and impact strength which is 3 to 5 times higher than that of ordinary glasses.*
- *As resistant to rapid temperature changes (thermal shocks). Tempered glass is approximately 3 times as ordinary float glasses.*
- *When broke, tempered glass breaks into fine particles, to prevent serious injuries.*

Applications

- *Frameless tempered glass doors*
- *Openings that require high safety levels*
- *Staircase handrails, escalators side plates, elevators panels.*
- *Furniture and decorations such as glass table, show case, etc.*
- *Vehicle windows, side panels.*
- *Special uses such as squash court wall partitions.*

Notes

- *As well balanced in tension and compression stress, it can not be cut, sanded or belt. All dimensions and specifications must be determined precisely before tempering process.*

Karakteristik Umum

Sistem balustrade ini menggunakan sealant secara maksimal untuk semua sambungan dan pendukungnya, tanpa menggunakan baut sama sekali.

Sistem ini sangat sederhana, mudah dalam pemasangan dan penggantian kaca, terlihat bersih dan sangat ekonomis.
Tanpa menggunakan baut, berarti tanpa ada lubang pada kaca sehingga kekuatan kaca menjadi maksimal tanpa ada gangguan.

Catatan

Gunakan handrail pada sekeliling tepi kaca untuk melindungi tepi kaca dari benturan langsung.
Kaca yang digunakan dalam system ini adalah Temperlite 12 mm atau Laminated Temperlite 12 mm dan 16 mm, dengan bahan pendukung sebagai berikut:

Bulking agent : Gipsum khusus (tipe 450)
Balok perletakan : Karet neoprene
Bahan pendukung : Karet neoprene berongga
Bahan penyekat : Silikon netral (hindari yang bersifat asam)

Perhitungan Kekuatan terhadap Tekanan

- **Perhitungan Beban Izin (Pa)**

$$Pa = \frac{500 \times Z}{H}$$

$$M = P \times H$$

$$\delta = \frac{M}{Z} = \frac{P \times H}{Z}$$

Dimana
Pa : Beban izin per 1 m lebar kaca (kg)
M : Momen kelengkungan (kg.cm)
δ : Gaya tekan(kg/cm^2) = 500 kg/cm^2 untuk tempered glass
P : Beban per 1 m lebar kaca (kg)
H : Tinggi balustrade (cm)
Z* : Section modulus (cm^3/m) (per 1 m lebar kaca)
** Lihat tabel – 1*

- **Perhitungan Lendutan**

$$\delta \max = \frac{P \times h^3}{Z}$$

Dimana
E : Modulus Young (72×10^4 kg/cm^2)
I* : Momen kedua dari luar kaca (cm^4/m) (per 1 m lebar kaca)
** Lihat tabel – 1*

Features

Glass Balustrade – SS System is specially developed and secured using sealant joint & sealant support without conventional bolting systems.

Very simple, short term time for installation, easier to replace, more economical, and better performance.
Without conventional bolting, means no drilling and notching on the glass, such as the strength of glass is maximized.

Notes

Always install a rigid handrail top of glass baluster to protect the edged and prevent individual deformation.
Glass used for this Balustrade-SS System is tempered glass of 12 mm thickness, laminated tempered glass of 12 mm or 16 mm thickness, with supporting materials:

Bulking agent : Special type of Gypsum (type 450)
Setting block : Neoprene rubber
Backup material : Hollow neoprene rubber
Sealing material : Neutral silicon sealant (avoid the acetic acid during type)

Calculation of Pressure Resistance Strength

- ***Calculation of allowable load (Pa)***

$$Pa = \frac{500 \times Z}{H}$$

$$M = P \times H$$

$$\delta = \frac{M}{Z} = \frac{P \times H}{Z}$$

Where
Pa : Allowable load per 1 mm width of glass (kg)
M : Bending moment (kg.cm)
δ : Stress (kg/cm^2) = 500 kg/cm^2 for Tempered glass
P : Load per 1 m width of glass (kg)
H : Balustrade height (cm)
Z : Section modulus (cm^3/m) (per 1 m width of glass)*
** Refer to the Table – 1*

- ***Perhitungan Lendutan***

$$\delta \max = \frac{P \times h^3}{Z}$$

Where
E : Young's modulus (72×10^4 kg/cm^2)
I : Second moment of area (cm^4/m) (per 1 m width of glass)*
** Refer to the Table – 1*

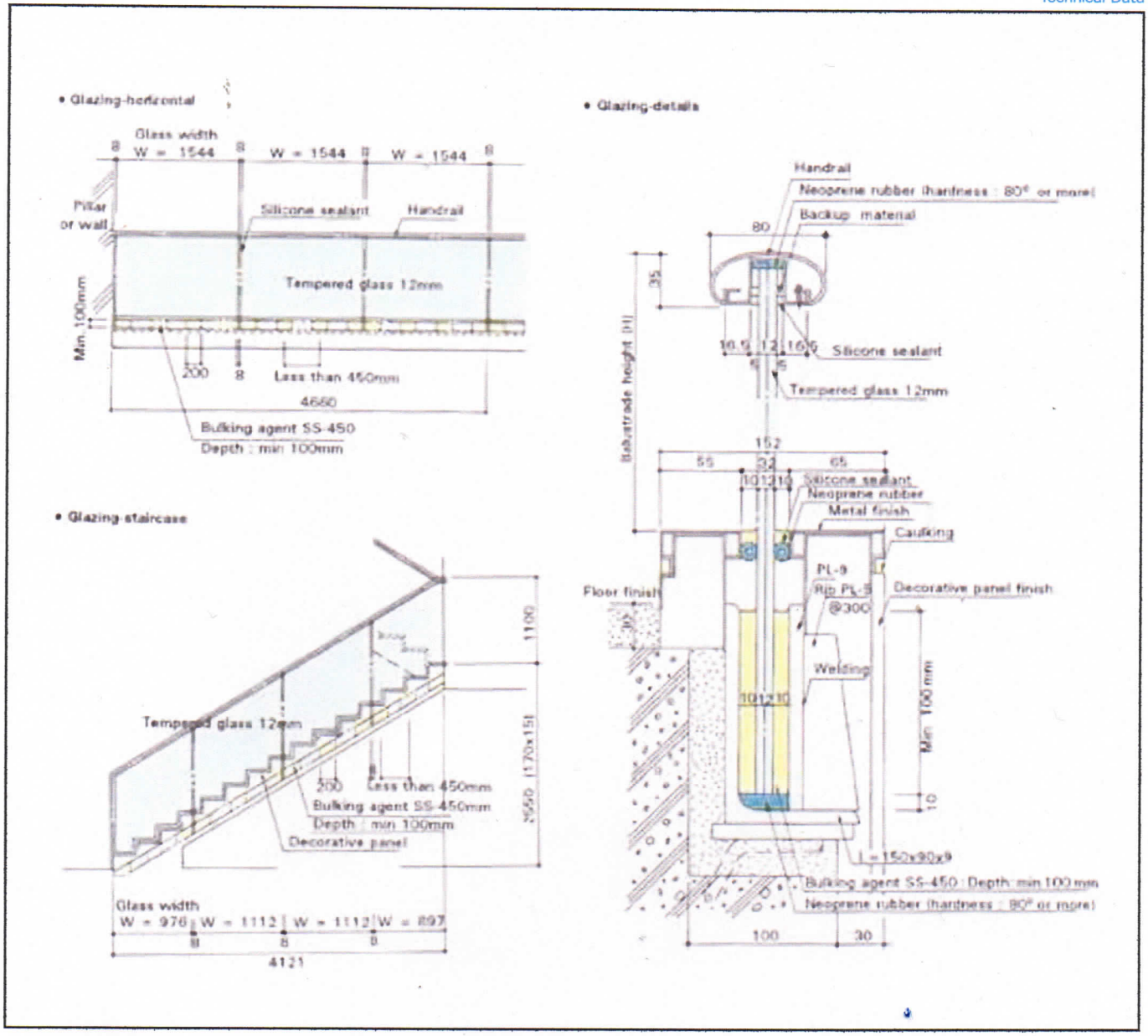


Table 1 Values of Z and I
(Per 1m Width of Glass)

Factor / Glass Type	Second Moment of Area (I)	Section Modulus (Z)
Laminated Tempered Glass 12 mm (6+6)	7.0 cm^4/m	14.4 cm^3/m
Tempered Glass 12 mm	14.4	24.0
Laminated Tempered Glass 16 mm (8+8)	17.0	25.6

• Table-2 Summarizes the Calculated Results

Glass Type / Balust rade Height (h)cm	Allowable Load (Pa) (Per 1m Width of Glass)		
	Laminated Tempered Glass 12mm (6+6)	Tempered Glass 12mm	Laminated Tempered Glass 12mm (6+6)
70	100 kg	170 kg	180 kg
80	90	150	160
90	80	130	140
100	70	120	130
110	65	110	120
120	60	100	105
130	55	90	95
140	50	85	90
150	50	80	85

• Table-3 Load by Body

Load / Action	Maximum (kg)	Average (kg)
Leaning Forward	18	9.9
Leaning Backward	13	8.1
Pushing	107	73.5
Pulling	99	79.0
Pushing by Running	127	67.4
Pushing by The Shoulder	71	36.3

7. SOUND INSULATION

Transmission Loss of Flat Glass

AGC Group

Table 1 Transmission Loss of Flat Glass

Type	Thickness (mm)	Transmission Loss (dB)		Coincidence Frequency (Hz)
		Mean T.L	STC	
Single Flat Glass	3	26	26	4250
	4	27	27	2880
	5	28	30	2530
	6	29	31	2020
	6.8	30	32	1760
	8	31	32	1500
	10	33	33	1190
	12	34	34	1010
	15	36	34	790
	19	36	33	620
(Laminated Glass)	6 (3+0.75+3)	31	33	2740
	10 (5+0.75+5)	35	37	1580
	12 (6+0.75+6)	37	38	1450

Catatan
Diukur oleh Institut Riset Fisika Kobayasi
Dimensi Kaca : 1700 x 1300 mm
Beban untuk setiap unit area dinding adalah 270 kg/cm3

Catatan
TC : Transmisi Hilang
STC : Koefisien Transmisi Suara

Table 3 Mean Transmission Losses of Other Materials For Reference

Materials	Thickness & Composition (mm)	Mean Transmission Loss (dB)
Lauan Plywood	3	14
Insulation Board	12	19
Asbestos Slate	6.5	23
Lauan Plywood Wall	57 (Lauan Plywood 6 + Air Layer 45 + Lauan Plywood 6 Gap Between Stud and Furring Strip 450)	23
Gypsum Plaster Board	9	26
Glass Block Wall	95	40
Concrete Block Wall	180 (Mortar 15 + Concrete Block 150 + Mortar 15)	44
Concrete Floor	145 (Concrete 100 + Ceiling Base 19 + Lath Board 13 + Plaster 13)	55

Note
Measured by Kobayasi Institute of Physical Research
Glass dimensions: 1700 x 1300 mm
Mass per unit area of filler wall is about 270 kg/cm²

Note
T.C. : Transmission Loss
S.T.C : Sound Transmission Coefficient

Table 2 Transmission Loss of Flat Glass at Each Frequency

Type (mm)	Frequency (Hz)	Unit (dB)																	
		100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
Single Flat Glass	FL3	10	20	19	19	20	22	25	25	26	28	30	31	32	33	34	32	22	26
	FL4	13	22	21	22	22	24	25	27	29	30	32	32	33	34	32	23	27	31
	FL5	15	23	23	23	23	26	27	28	30	31	33	34	34	33	26	27	29	33
	FL6	15	24	24	24	25	27	28	30	32	33	34	34	33	27	28	30	34	37
	FL8	17	26	26	26	27	29	30	32	33	35	35	30	28	30	33	37	40	42
	FL10	19	28	28	28	29	30	33	34	35	35	33	29	32	34	38	40	44	47
	FL12	21	30	29	30	29	32	33	34	35	34	29	32	36	38	40	43	47	50
	FL15	22	30	31	31	30	34	34	35	35	28	30	35	38	42	44	45	49	52
	FL19	22	30	31	32	32	35	35	34	28	27	32	36	39	44	46	48	50	52
(Laminated Glass)	PL6(FL3+0.75+FL3)	18	26	25	25	25	28	29	30	33	34	34	35	35	33	33	34	38	42
	PL10(FL5+0.75+FL5)	22	29	29	28	30	32	34	35	36	37	36	35	35	37	40	43	47	49
	PL12(FL6+0.75+FL6)	23	29	31	30	31	34	35	36	37	37	35	35	37	40	42	46	49	53

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NOTES

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NOTES

ELINDO – Depo Bangunan

Depo I : KERAMIK, SANITAIR, CAT, BAHAN BANGUNAN LAIN
*Jl. Raya Magelang – Semarang No. 120 Payaman – **MAGELANG** 56195*
Telp. (0293) 369255, 360127, Fax. (0293)369255, HP. 0811257583
Depo II : KAYU KALIMANTAN, BESI, BAHAN BANGUNAN LAIN
*Jl. Jend. A. Yani No. 427 Kupatan – **MAGELANG** 56115*
Telp. (0293) 369036, 365128, Fax. (0293) 369036, HP. 0811286017

Nomor : 001/ELIND/V/2019
Lampiran : -
Perihal : **Surat Dukungan Bahan Material**

Yang bertanda tangan dibawah ini

N a m a : **TITIK YULIYATI**
Jabatan : Manager
Perusahaan : **ELINDO DEPO BANGUNAN**
Alamat : Jl. Raya Magelang - Semarang No. 120 Payaman, Magelang

Dengan ini menyatakan bahwa kami bersedia mendukung :

Nama : **MAS'UD AZIZI**
Jabatan : Direktur
Perusahaan : **CV. BAROKAHJAYA**
Alamat : Lingk. Daleman Asri RT.003 RW.004 Mungseng Temanggung

Guna untuk mengikuti Pelelangan

Pekerjaan Kontruksi Pembuatan Jembatan Penghubung Gedung A dan Gedung H Fakultas Hukum Universitas Diponegoro – Semarang Tahun Anggaran 2019

dengan Pengadaan Bahan Material berupa:

No	Nama Bahan Material	Spesifikasi	Merk
1.	Granite Tile	60 x 60	GRANITO
	Plint Lantai	8 x 60	GRANITO
	Keramik	20 x 25	ASIA TILE
	Keramik Plint	60 x 20	ASIA TILE
	Keramik Lantai Motif Warna	20 x 20	ASIA TILE
2.	Cat Tembok Interior, Eksterior, Plafond		MOWILEX
	Cat Kayu		EMCO
3.	Kabel		SUPREME
	Kabel Tray	Bentuk U lebar 30 cm, sisi kanan kiri 10 cm tebal 3 mm	
	Pipa Conduit		
	Lampu SCB-32 ACR		PHILIPS
	Lampu Integrated	(RMI 300GLOOS STRIP) ALML 2X 18 Watt	PHILIPS
		RUMAH LAMPU	PHILIPS
	Saklar dan Stop Kntak		BROCO
	Downlight	RD 150 Essential 18 Watt	PHILIPS
	Lampu Fitting Pendel/Gantung Essential 18 Watt	Gip 1,5" medium B kedalaman mencapai ketahanan 5 Ohm	
	Panel : MCCB, MCB, COS		SCHNEIDER

4.	Closet Duduk		AMERICAN STANDART
	Tempat Sabun		DEXON
	Floordrain		DEXON STAINLESS
	Stop Kran, Kran Air		SAN-EI
5.	Pipa PVC		RUCIKA

Demikian surat dukungan ini kami buat agar dapat dipergunakan sebagaimana mestinya.

Magelang, 20 Mei 2019

ELINDO DEPO BANGUNAN

Mitra Anda Dalam Membangun

METERAI TEMPEL
D29C4AFF839476615
6000
ENAM RIBU RUPIAH

TITIK YULIYATI

Manager

GRANITO™

LIVING IN STYLE WITH THE ULTIMATE TILE

Sept 2016



TOP BRAND 2014 - 2016

QUAL
YOU C
TRU

Salsa



crystal



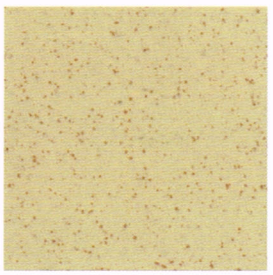
black
40x40 cm
60x60 cm



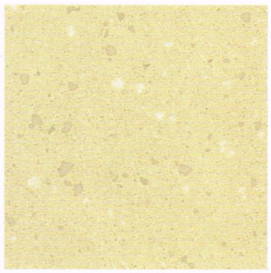
brick
40x40 cm



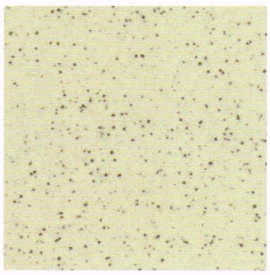
greystone
40x40 cm
60x60 cm



linen
40x40 cm



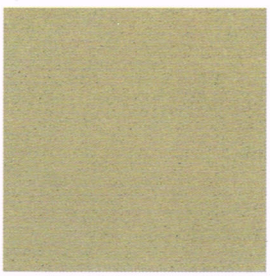
white sands
60x60 cm



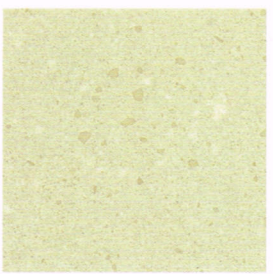
ivory
40x40 cm
60x60 cm

frost white
60x60 cm
80x80 cm

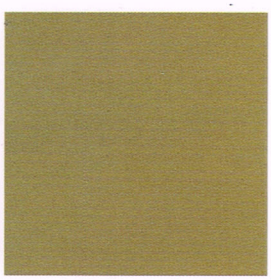
honey
60x60 cm



aluminium
60x60 cm



water stone
40x40 cm
60x60 cm



coffee
60x60 cm



steel
60x60 cm

pearl white
40x40 cm
60x60 cm
30x60 cm

groove
60x120 cm

UD. HARTONO
P A T

Ambience



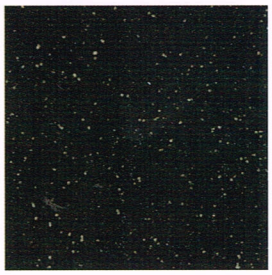
mirror

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Salsa



oasis



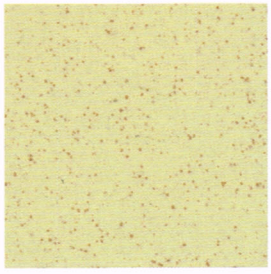
black
40x40 cm
60x60 cm



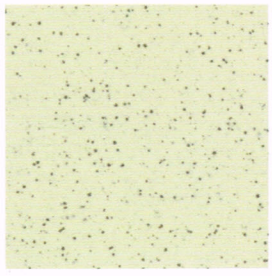
brick
40x40 cm



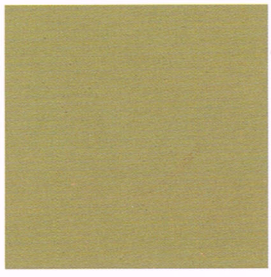
greystone
40x40 cm
60x60 cm



linen
40x40 cm



ivory
40x40 cm

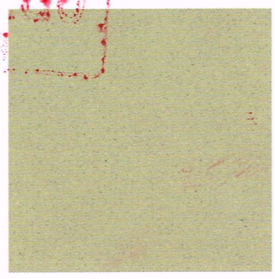


coffee
60x60 cm

pearl white
40x40 cm
60x60 cm



steel
60x60 cm

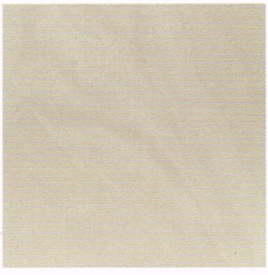


aluminium
60x60 cm

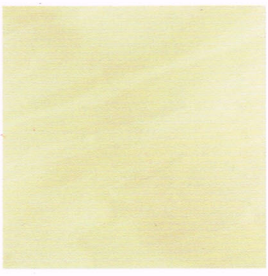
UD: HARTONO
PAT

palermo
60x60 cm

arezzo
60x60 cm



monza
60x60 cm



estate
60x60 cm

PALAZZ



mirror

GRANI
LIVING IN STYLE WITH THE ULTI

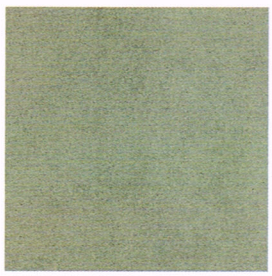
LUNAR



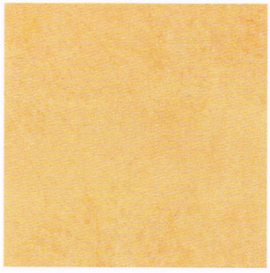
rustic



amber
60x60 cm
30x60 cm



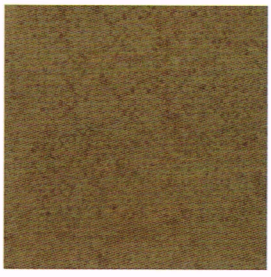
alumina
60x60 cm
30x60 cm



solar
60x60 cm
30x60 cm



helium
60x60 cm
30x60 cm



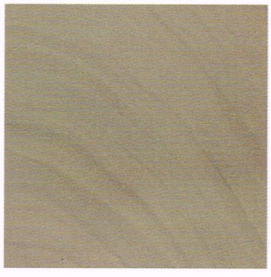
terra
60x60 cm
30x60 cm



zephyr
60x60 cm
30x60 cm

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casa
60x60 cm



villa
60x60 cm

SABBIA



mirror

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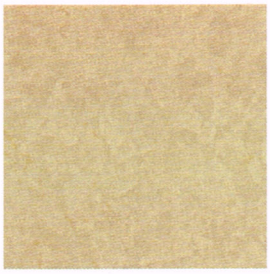
castello



rustic



espresso
40x40 cm



crema
40x40 cm



rosso
40x40 cm

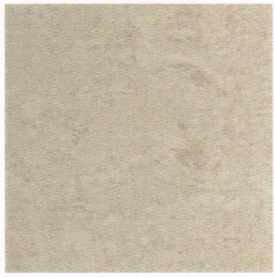


rombo
40x40 cm

waffle
60x60 cm
30x60 cm



latte
60x60 cm
30x60 cm



Silk
60x60 cm



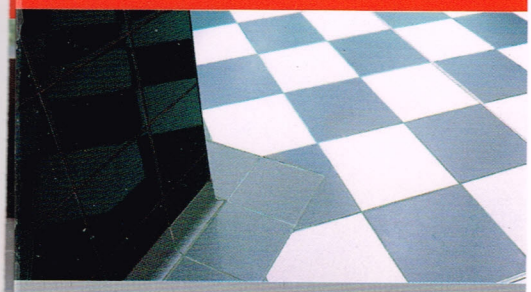
AURORA



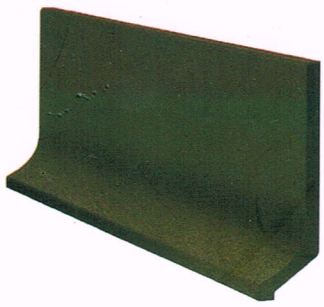
mirror

GRANITO
LIVING IN STYLE WITH THE ULTIMATE

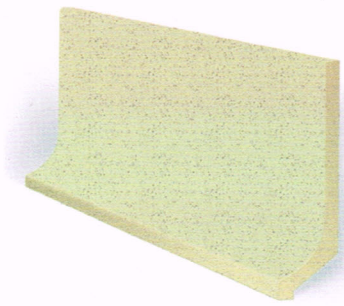
cove



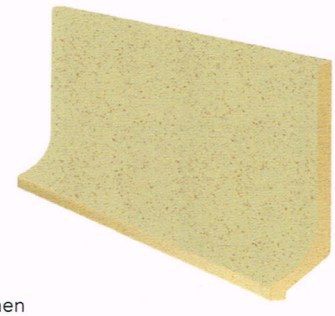
cove



black
20 x 10 x 2.8 cm



ivory
20 x 10 x 2.8 cm



linen
20 x 10 x 2.8 cm



pearl white
20 x 10 x 2.8 cm

Granito TILE NETWORK

DISTRIBUTOR

Manufactured by PT Granitoguna Building Ceramics, Indonesia under license of Australian Building Ceramics Pty Ltd, Australia

All information is correct at time of printing. Colours represented are indicative only and as close to the true colour of the tile as the printing process allows. Please contact Granito representatives for actual samples prior to ordering.

Floor & Wall Tile Selector Version: 3067

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Tel : (62-21) 386 7707
Fax : (62-21) 386 7708
e-mail : info@granito.co.id
http : www.granito.co.id

GRANITO™ TILE STUDIO

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Jakarta 10110, Indonesia.
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Fax : (62-21) 386 7708
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GTS SURABAYA
Graha Pasific Building, 11th Floor
• JL. Basuki Rachmat No.87-91 Surabaya 60
Jawa Timur, Indonesia
Tel : (62-31) 5458 222
Fax : (62-31) 5355 922
e-mail : gts.surabaya@granito.co.id

GRANITO™
LIVING IN STYLE WITH THE ULTIMATE TILE

ASIA TILE



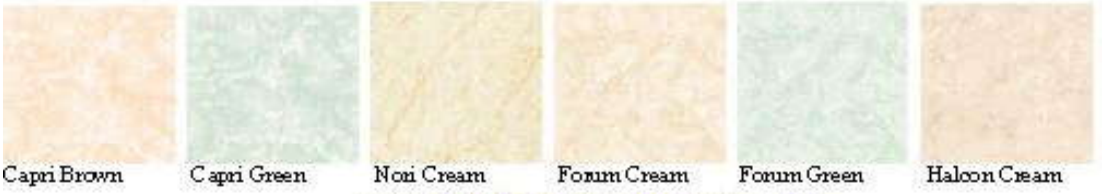




www.riskyjaya.indonetwork.co.id







www.riskyjaya.indonetwork.co.id

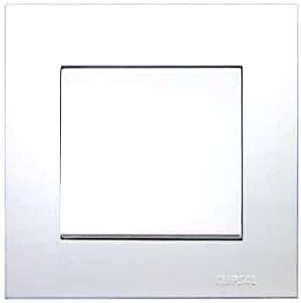




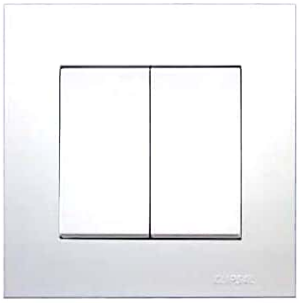




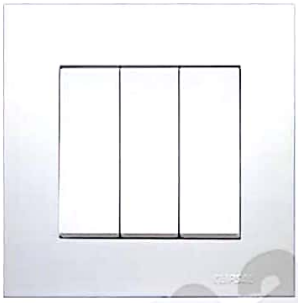
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Saklar Engkel



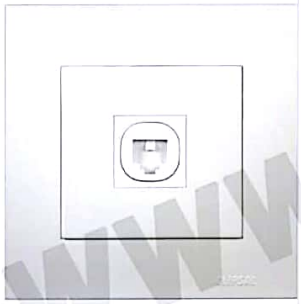
Saklar Seri



Saklar Triple



Stop Kontak



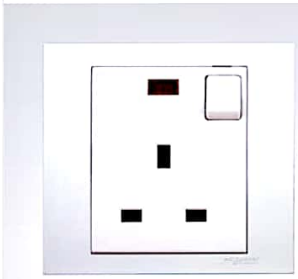
Outlet Telpon



Outlet TV



Outlet Data



Stop Kontak AC

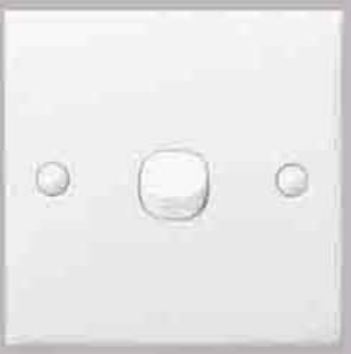
CLIPSAL VIVACE

www.jayamapan.com

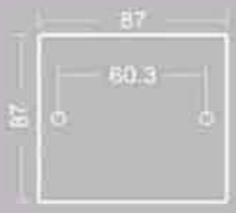
Scanned by CamScanner



Scanned by CamScanner



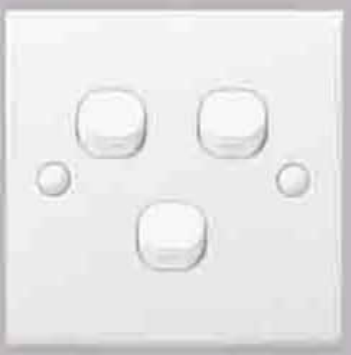
E31/1/2A 10A 1 gang 1 way 2 terminal switch
E31/2/3A 10A 1 gang 2 way 3 terminal switch
E31IA 10A 1 gang intermediate switch



www.alatlistrik.com
CLIPSAL



E32/1/2A 10A 2 gang 1 way 2 terminal switch
E32/2/3A 10A 2 gang 2 way 3 terminal switch



E33/1/2A 10A 3 gang 1 way 2 terminal switch
E33/2/3A 10A 3 gang 2 way 3 terminal switch



E34/1/2A 10A 4 gang 1 way 2 terminal switch
E34/2/3A 10A 4 gang 2 way 3 terminal switch



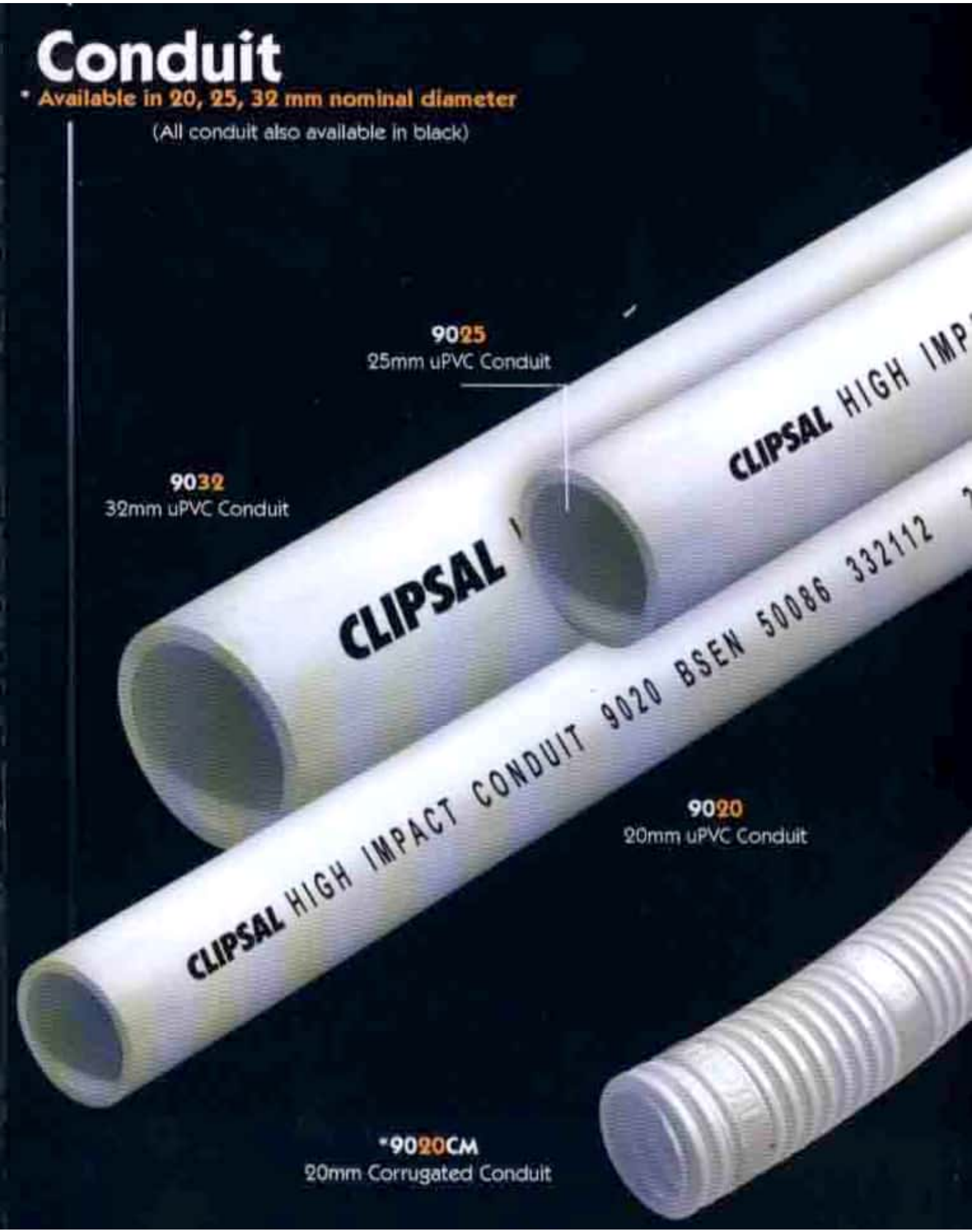
E35/1/2A 10A 5 gang 1 way 2 terminal switch
E35/2/3A 10A 5 gang 2 way 3 terminal switch

Scanned by CamScanner

Conduit

* Available in 20, 25, 32 mm nominal diameter

(All conduit also available in black)



9025
25mm uPVC Conduit

9032
32mm uPVC Conduit

9020
20mm uPVC Conduit

***9020CM**
20mm Corrugated Conduit

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LCT®

Link Cable Tray

YOUR BEST CABLE TRAY PRODUCT & SYSTEM

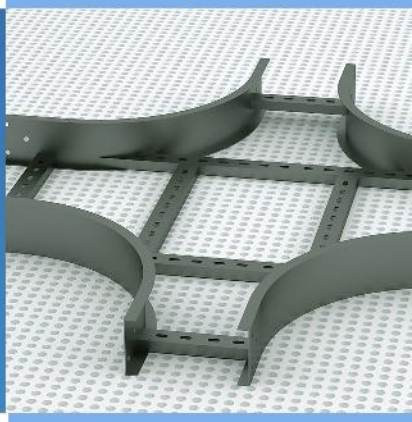


KABEL TRAY

KABEL DUCT

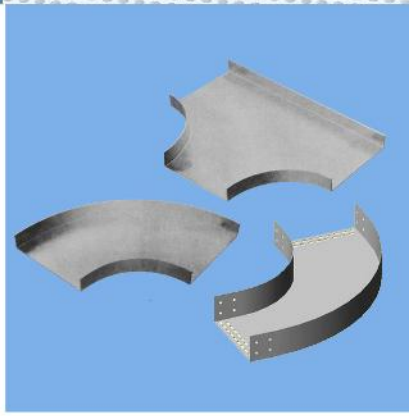
KABEL LADDER

WIREMESH KABEL TRAY / BRC CAGE / CABLE CAGE



SPESIFIKASI

BAHAN	: PLAT HITAM SPHC KRAKATAU STEEL ATAU ALUMINIUM
TEBAL	: 1,8 - 2,0 MM DAN BERAGAM TEBAL LAINNYA
PANJANG	: 3000 MM DAN BERAGAM PANJANG LAINNYA
TINGGI	: 50 MM, 100 MM DAN BERAGAM TINGGI LAINNYA
LEBAR	: 50 MM S/D 1000 MM DAN BERAGAM LEBAR LAINNYA
FINISHING	: ELECTRO GALVANIZE OR HOTDIP GALVANIZE
KOMITMEN	: HARGA KOMPETITIF, PRIME QUALITY, KAPASITAS PRODUKSI SKALA BESAR





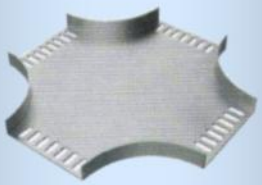
TRAY

Kabel Tray Berlubang atau biasa disebut **Kabel Tray** adalah bentuk ideal untuk aplikasi dalam instalasi kabel yang menghasilkan panas yang sedang. Lubang-lubang yang ada pada Kabel Tray memberikan ventilasi yang cukup untuk menghindari terjebaknya panas di dalam rangkaian kabel Tray.

Kabel Tray Type C



Cross Tray



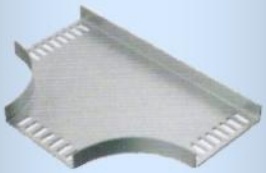
Elbow Tray



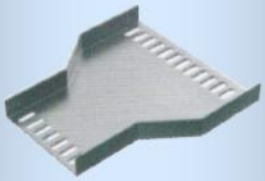
Kabel Tray Type U



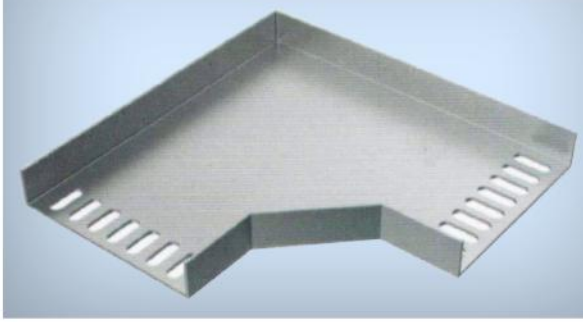
Tee Tray



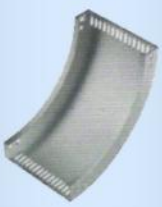
Reducer Tray



Elbow Tray Siku



IR Tray



OR Tray



LADDER

Kabel Ladder adalah kabel tray yang dibentuk dari 2 batang besi samping yang dihubungkan oleh palang-palang besi sehingga membentuk kabel tray yang menyerupai tangga. Kabel Ladder adalah bentuk ideal untuk aplikasi dalam instalasi kabel yang membutuhkan : perlindungan dari besi samping yang solid, kekuatan struktur penyokong, dan pada instalasi kabel dengan jarak yang menengah sampai jarak jauh.

Kabel Ladder SLW



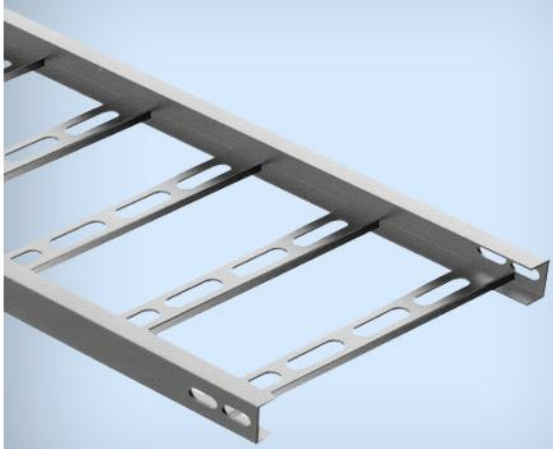
Elbow Ladder



Tee Ladder



Kabel Ladder SLU



IR Ladder



OR Ladder



Cross Ladder



Reducer Ladder

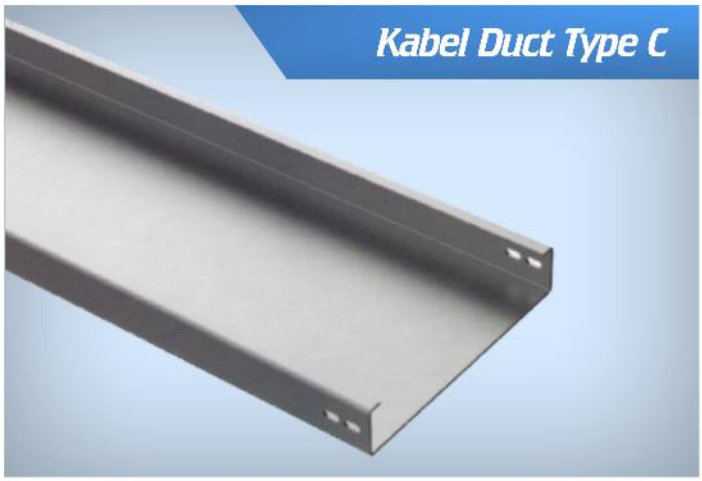


Elbow Ladder Siku



DUCT,WIREMESH & Accessories

Kabel Tray Polos atau biasa disebut **Kabel Duct** adalah bentuk ideal untuk aplikasi dalam instalasi kabel yang tidak menghasilkan panas. Kabel Duct memberikan perlindungan yang lebih baik karena tertutup rapat.

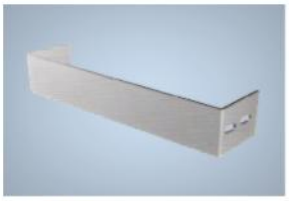


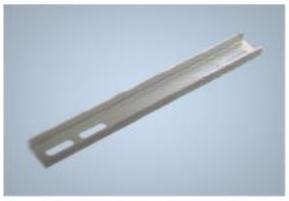
Kabel Tray Wiremesh adalah kawat logam yang dirancang untuk dipasang diberbagai area berguna sebagai tatakan / keranjang kabel-kabel konstruksi atau jaringan kabel.



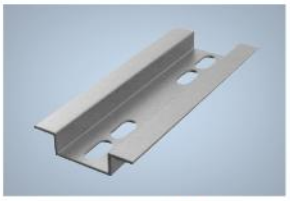
Aksesoris penunjang pemasangan

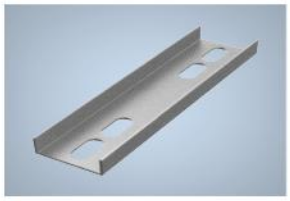

Hanger Beam


End Plate

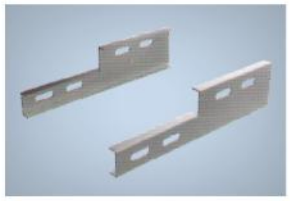

Joint Tray C


Joint Tray U


Joint Ladder SLW


Joint Ladder SLU


Bracket Mounting


Joggled Plate


Cover Clamp


Set Gantungan

Project Refferences

PT. Fengtay (Nike Indonesia)
PT. Pertamina Tbk
PT. Krakatau Steel
PT. Kohrindo Heavy Industry
PT. Total Bangun Persada Tbk
PT. Takenaka
PT. Kinden Indonesia
PT. Toyota Tsusho Indonesia
PT. Adiwisesa (Djarum Group)
PT. Packet Systems

*** Harap menghubungi Customer Service untuk detail Project Refferences lainnya*

Company Background

Specializing in the cable business since 1970, PT. SUPREME CABLE MANUFACTURING & COMMERCE Tbk. (PT. SUCACO Tbk) has grown steadly to become a largest and leading cable manufacturer, with international reputation for quality and reliablity. Established in 1970, PT SUCACO Tbk. is a pioneer in the modern industry. With technical assistance from Furukawa Electric Co Ltd Japan and International Executives Service Corp, USA, the company began commercial operations in 1972.

We produce and markets power cable up to 150 kV, optical and telecommunication cables, control cables, instrumentation cables, coaxial cables and enamelled wires under brand name of " SUPREME ". The Company is also involved through its affiliated companies, in various line of business. The company has a Quality Assurance Program and ISO 9001 certificate from SGS international certification body of quality management system. Today, PT SUCACO Tbk. has grown to become a reliable partner in infrastructures, buildings and various projects.


SUPREME CABLE
SUPREME CABLE

Index Low Voltage PVC Insulated Cables

CABLE TYPE	SIZE	VOLTAGE (kV)	STANDARD	PAGE
NYY	1~5 cores	0.6/1(1.2)	SPLN 43/IEC 60502-1	1~6
NYY control cable	1.5~6 mm2	0.6/1(1.2)	SPLN 43/IEC 60502-1	7~10
NYRY	1 core	0.6/1(1.2)	IEC 60502-1	11
NYRGbY & NYFGbY	2~5 cores	0.6/1(1.2)	SPLN 43/IEC 60502-1	12-16
NYRGbY & NYFGbY control cable	1.5~6 cores	0.6/1(1.2)	SPLN 43/IEC 60502-1	17~20
NYSY	1~4 cores	0.6/1(1.2)	IEC 60502-1	21~24
NYSY control cable	1.5~6 mm2	0.6/1(1.2)	IEC 60502-1	25~28
Installation Guide & Derating Factors				31~36
CONVERSION TABLE				37



NYY 0.6/1(1.2) kV

SPLN 43-1/IEC 60502-1

Copper conductor, PVC insulated and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **1 Core**

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness		Approximately		Bending radius min	Standard delivery length
			Insulation	Outer sheath	Overall diameter	Net Weight		
mm²	pcs	-				Kg/Km	mm	m
1.5	1	re	0.8	1.4	6	34	80	1,000
1.5	7	rm	0.8	1.4	7	55	90	1,000
2.5	1	re	0.8	1.4	7	66	90	1,000
2.5	7	rm	0.8	1.4	7	70	90	1,000
4	1	re	1.0	1.4	8	91	100	1,000
4	7	rm	1.0	1.4	8	97	100	1,000
6	1	re	1.0	1.4	8	113	100	1,000
6	7	rm	1.0	1.4	9	121	110	1,000
10	1	re	1.0	1.4	9	157	110	1,000
10	7	rm	1.0	1.4	9	168	110	1,000
16	7	rm	1.0	1.4	11	234	140	1,000
25	7	rm	1.2	1.4	12	344	150	1,000
35	7	rm	1.2	1.4	13	445	160	1,000
50	19	rm	1.4	1.4	15	578	180	1,000
70	19	rm	1.4	1.4	17	793	210	1,000
95	19	rm	1.6	1.5	19	1,079	230	1,000
120	67	rm	1.6	1.5	21	1,319	260	1,000
150	37	rm	1.8	1.6	23	1,622	280	1,000
185	37	rm	2.0	1.7	25	2,009	300	1,000
240	61	rm	2.2	1.8	29	2,612	350	1,000
300	61	rm	2.4	1.9	32	3,236	390	1,000
400	61	rm	2.6	2.0	35	4,077	420	1,000
500	61	rm	2.8	2.1	39	5,139	470	500

ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
			⊙⊙⊙	⊙⊙⊙	
mm²	Ω/Km	MΩ.Km	A		kA
1.5	12.1	50	26	33	0.19
2.5	7.41	50	25	45	0.32
4	4.61	50	46	58	0.50
6	3.08	50	58	74	0.73
10	1.83	50	80	98	1.20
16	1.15	40	100	107	1.91
25	0.727	40	135	138	2.96
35	0.524	40	170	185	4.13
50	0.387	30	205	196	5.87
70	0.268	30	260	240	8.19
95	0.193	30	320	289	11.09
120	0.153	30	375	329	13.98
150	0.124	20	430	374	17.46
185	0.0991	20	490	418	21.50
240	0.0754	20	590	481	27.86
300	0.0601	20	680	552	34.79
400	0.0470	20	825	632	41.50
500	0.0366	20	960	730	51.84







NYY 0.6/1(1.2) kV

SPLN 43-1/IEC 60502-1

Copper conductor, PVC insulated and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — 2 Cores

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness		Approximately		Bending radius min	Standard delivery length
			Insulation	Outer sheath	Overall diameter	Net Weight		
mm²	pcs	-	mm	mm	mm	Kg/Km	mm	m
1.5	1	re	0.8	1.8	12	205	150	1,000
1.5	7	rm	0.8	1.8	13	213	160	1,000
2.5	1	re	0.8	1.8	13	243	160	1,000
2.5	7	rm	0.8	1.8	14	259	170	1,000
4	1	re	1.0	1.8	15	326	180	1,000
4	7	rm	1.0	1.8	16	351	200	1,000
6	1	re	1.0	1.8	16	390	200	1,000
6	7	rm	1.0	1.8	17	422	210	1,000
10	1	re	1.0	1.8	18	514	220	1,000
10	7	rm	1.0	1.8	18	557	220	1,000
16	7	rm	1.0	1.8	21	744	260	1,000
25	7	rm	1.2	1.8	24	1,066	290	1,000
35	7	rm	1.2	1.8	26	1,342	320	1,000
50	19	rm	1.4	1.8	30	1,735	360	1,000
70	19	rm	1.4	1.9	33	2,331	400	1,000
95	19	rm	1.6	2.0	39	3,159	470	1,000
120	37	rm	1.6	2.1	42	3,829	510	1,000
150	37	rm	1.8	2.2	46	4,667	560	500
185	37	rm	2.0	2.4	51	5,805	620	500
240	61	rm	2.2	2.6	58	7,482	700	500
300	61	rm	2.4	2.7	64	9,253	770	500



ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
mm²	Ω/Km	MΩ.Km	A		kA
1.5	12.1	50	21	27	0.19
2.5	7.41	50	29	36	0.32
4	4.61	50	38	47	0.50
6	3.08	50	48	59	0.73
10	1.83	50	66	78	1.20
16	1.15	40	90	102	1.91
25	0.727	40	120	134	2.96
35	0.524	40	150	160	4.13
50	0.387	30	180	187	5.87
70	0.268	30	230	230	8.19
95	0.193	30	275	280	11.09
120	0.153	30	320	320	13.98
150	0.124	20	375	355	17.46
185	0.0991	20	430	409	21.50
240	0.0754	20	510	472	27.86
300	0.0601	20	590	525	34.79



NYY 0.6/1(1.2) kV

SPLN 43-1/IEC 60502-1

Copper conductor, PVC insulated and PVC sheathed cable

DIMENSIONAL & MECHANICA — **3 Cores**

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness		Approximately		Bending radius min	Standard delivery length
			Insulation	Outer sheath	Overall diameter	Net Weight		
mm²	pcs	-	mm			Kg/Km	mm	m
1.5	1	re	0.8	1.8	13	229	160	1,000
1.5	7	rm	0.8	1.8	13	237	160	1,000
2.5	1	re	0.8	1.8	14	276	170	1,000
2.5	7	rm	0.8	1.8	14	295	170	1,000
4	1	re	1.0	1.8	16	377	200	1,000
4	7	rm	1.0	1.8	16	406	200	1,000
6	1	re	1.0	1.8	17	459	210	1,000
6	7	rm	1.0	1.8	17	495	210	1,000
10	1	re	1.0	1.8	28	620	220	1,000
10	7	rm	1.0	1.8	19	669	230	1,000
16	7	rm	1.0	1.8	22	912	270	1,000
25	7	rm	1.2	1.8	25	1,325	300	1,000
35	7	rm	1.2	1.8	28	1,688	340	1,000
35	19	sm	1.2	1.8	28	1,411	300	1,000
50	19	sm	1.4	1.8	28	1,829	340	1,000
70	19	sm	1.4	2.0	31	2,527	380	1,000
95	19	sm	1.6	2.1	36	3,404	440	1,000
120	37	sm	1.6	2.2	38	4,155	460	1,000
150	37	sm	1.8	2.3	43	5,119	520	500
185	37	sm	2.0	2.5	47	6,324	570	500
240	37	sm	2.2	2.7	53	8,224	640	500
300	37	sm	2.4	3.1	59	10,304	710	300



ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
mm²	Ω/Km	MΩ.Km	A		kA
1.5	12.1	50	18	24	0.19
2.5	7.41	50	25	32	0.32
4	4.61	50	34	41	0.50
6	3.08	50	44	52	0.73
10	1.83	50	60	69	1.20
16	1.15	40	80	89	1.91
25	0.727	40	105	116	2.96
35	0.524	40	130	138	4.13
50	0.387	30	160	165	5.87
70	0.268	30	200	205	8.19
95	0.193	30	245	245	11.09
120	0.153	30	285	285	13.98
150	0.124	20	325	315	17.46
185	0.0991	20	370	355	21.50
240	0.0754	20	435	415	27.86
300	0.0601	20	500	465	34.79



NYY 0.6/1(1.2) kV

SPLN 43-1/IEC 60502-1

Copper conductor, PVC insulated and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **3 Cores + 1 ground**

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness		Approximately		Bending radius min	Standard delivery length
			Insulation	Outer sheath	Overall diameter	Net Weight		
mm²	pcs	-	mm			Kg/Km	mm	m
3 x 25 + 16	7/7	rm/rm	1.2/1.0	1.8	27	1,501	330	1,000
3 x 35 + 16	7/7	rm/rm	1.2/1.0	1.8	29	1,846	350	1,000
3 x 35 + 16	19/7	sm/rm	1.2/1.0	1.8	28	1,668	340	1,000
3 x 50 + 25	19/7	sm/rm	1.4/1.2	1.9	32	2,224	390	1,000
3 x 70 + 35	19/7	sm/rm	1.4/1.2	2.0	36	3,024	440	1,000
3 x 95 + 50	19/19	sm/rm	1.6/1.4	2.2	40	4,051	480	1,000
3 x 120 + 70	37/19	sm/rm	1.6/1.4	2.3	44	5,083	530	500
3x 150 + 70	37/19	sm/rm	1.8/1.4	2.4	49	6,052	590	500
3 x 185 + 95	37/19	sm/rm	2.0/1.6	2.6	53	7,535	640	500
3x 240 + 120	37/37	sm/rm	2.2/1.6	2.8	60	9,725	720	300
3 x 300 + 150	37/37	sm/rm	2.4/1.8	2.9	65	11,983	780	300

ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
mm²	Ω/Km	MΩ.Km	A		kA
3 x 25 + 16	0.727/1.15	40	105	116	2.96
3 x 35 + 16	0.524/1.15	40	130	138	4.13
3 x 50 + 25	0.387/0.727	30	160	165	5.87
3 x 70 + 35	0.268/0.524	30	200	205	8.19
3 x 95 + 50	0.193/0.387.	30	245	245	11.09
3 x 120 + 70	0.153/0.268	30	285	285	13.98
3x 150 + 70	0.124/0.268	20	325	315	17.46
3 x 185 + 95	0.0991/0.193	20	370	355	21.50
3x 240 + 120	0.0754/0.153	20	435	415	27.86
3 x 300 + 150	0.0601/0.124	20	500	465	34.79





NYY 0.6/1(1.2) kV

SPLN 43-1/IEC 60502-1

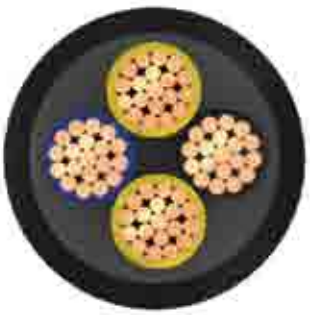
Copper conductor, PVC insulated and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — 4 Cores

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness		Approximately		Bending radius min	Standard delivery length
			Insulation	Outer sheath	Overall diameter	Net Weight		
mm^2	pcs	-	mm			Kg/Km	mm	m
1.5	1	re	0.8	1.8	14	262	170	1,000
1.5	7	rm	0.8	1.8	14	272	170	1,000
2.5	1	re	0.8	1.8	15	320	180	1,000
2.5	7	rm	0.8	1.8	15	343	180	1,000
4	1	re	1.0	1.8	17	443	210	1,000
4	7	rm	1.0	1.8	18	477	220	1,000
6	1	re	1.0	1.8	18	546	220	1,000
6	7	rm	1.0	1.8	19	589	230	1,000
10	1	re	1.0	1.8	20	749	240	1,000
10	7	rm	1.0	1.8	21	807	260	1,000
16	7	rm	1.0	1.8	24	1,113	290	1,000
25	7		1.2	1.8	28	1,630	340	1,000
35	7	rm	1.2	1.8	30	2,092	360	1,000
35	19	sm	1.2	1.8	28	1,869	340	1,000
50	19	sm	1.4	1.9	32	2,491	390	1,000
70	19	sm	1.4	2.1	36	3,381	440	1,000
95	19	sm	1.6	2.2	40	4,534	480	500
120	37	sm	1.6	2.3	44	5,596	530	500
150	37	sm	1.8	2.5	49	6,877	590	500
185	37	sm	2.0	2.7	53	8,462	640	500
240	37	sm	2.2	2.9	60	10,999	720	300
300	37	sm	2.4	3.1	66	13,616	800	300

ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
mm^2	Ω/Km	MΩ.Km	A		kA
1.5	12.1	50	18	24	0.19
2.5	7.41	50	25	32	0.32
4	4.61	50	34	41	0.50
6	3.08	50	44	52	0.73
10	1.83	50	60	69	1.20
16	1.15	40	80	89	1.91
25	0.727	40	105	116	2.96
35	0.524	40	130	138	4.13
50	0.387	30	160	165	5.87
70	0.268	30	200	205	8.19
95	0.193	30	245	245	11.09
120	0.153	30	285	285	13.98
150	0.124	20	325	315	17.46
185	0.0991	20	370	355	21.50
240	0.0754	20	435	415	27.86
300	0.0601	20	500	465	34.79





NYY 0.6/1(1.2) kV

SPLN 43-1/IEC 60502-1

Copper conductor, PVC insulated and PVC sheathed cable

DIMENSIONAL & MECHANICA — **5 Cores**

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness		Approximately		Bending radius min	Standard delivery length
			Insulation	Outer sheath	Overall diameter	Net Weight		
mm^2	pcs	-	mm			Kg/Km	mm	m
1.5	1	re	0.8	1.8	15	306	180	1,000
1.5	7	rm	0.8	1.8	15	317	180	1,000
2.5	1	re	0.8	1.8	16	375	200	1,000
2.5	7	rm	0.8	1.8	16	401	200	1,000
4	1	re	1.0	1.8	18	529	220	1,000
4	7	rm	1.0	1.8	19	568	230	1,000
6	1	re	1.0	1.8	19	652	230	1,000
6	7	rm	1.0	1.8	20	701	240	1,000
10	1	re	1.0	1.8	21	897	260	1,000
10	7	rm	1.0	1.8	23	974	280	1,000
16	7	rm	1.0	1.8	26	1,343	320	1,000
25	7	rm	1.2	1.8	30	1,992	360	1,000
35	7	rm	1.2	1.9	33	2,569	400	1,000
50	19	rm	1.4	2.0	39	3,421	470	500

ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
mm^2	Ω/Km	MΩ.Km	A		kA
1.5	12.1	50	18	24	0.19
2.5	7.41	50	25	32	0.32
4	4.61	50	34	41	0.50
6	3.08	50	44	52	0.73
10	1.83	50	60	69	1.20
16	1.15	40	80	89	1.91
25	0.727	40	105	116	2.96
35	0.524	40	130	138	4.13
50	0.387	30	160	165	5.87





NYY 0.6/1(1.2) kV

SPLN 43-1/IEC 60502-1

Copper conductor, PVC insulated and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **Control cable 1.5 mm2**

No of cores	No of wire and conductor shape		Nominal Thickness		Approximately		Bending radius min	Standard delivery length
			Insulation	Outer sheath	Overall diameter	Net Weight		
pcs	pcs	-	mm			Kg/Km	mm	m
7	1	re	0.8	1.8	16	37	200	500
7	7	rm	0.8	1.8	16	348	200	500
8	1	re	0.8	1.8	17	372	210	500
8	7	rm	0.8	1.8	17	385	210	500
10	1	re	0.8	1.8	19	448	230	500
10	7	rm	0.8	1.8	19	463	230	500
12	1	re	0.8	1.8	19	499	230	500
12	7	rm	0.8	1.8	20	516	240	500
14	1	re	0.8	1.8	20	554	240	500
14	7	rm	0.8	1.8	21	573	260	500
16	1	re	0.8	1.8	21	621	260	500
16	7	rm	0.8	1.8	22	642	270	500
19	1	re	0.8	1.8	22	690	270	500
19	7	rm	0.8	1.8	22	714	270	500
21	1	re	0.8	1.8	23	747	280	500
21	7	rm	0.8	1.8	23	773	280	500
24	1	re	0.8	1.8	25	845	300	500
24	7	rm	0.8	1.8	26	874	320	500
30	1	re	0.8	1.8	26	994	320	500
30	7	rm	0.8	1.8	27	1,029	330	500
40	1	re	0.8	1.8	29	1,253	350	500
40	7	rm	0.8	1.8	30	1,296	360	500
52	1	re	0.8	1.9	33	1,619	400	500
52	7	rm	0.8	1.9	34	1,674	410	500
61	1	re	0.8	2.0	36	1,854	420	500
61	7	rm	0.8	2.0	36	1,918	440	500

ELECTRICAL DATA

No of cores	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
pcs	Ω/Km	MΩ.Km	A		kA
7	12.1	50	10	14	0.19
8	12.1	50	10	14	0.19
10	12.1	50	9	12	0.19
12	12.1	50	9	12	0.19
14	12.1	50	8	10	0.19
16	12.1	50	8	10	0.19
19	12.1	50	7	9	0.19
21	12.1	50	7	9	0.19
24	12.1	50	6	8	0.19
30	12.1	50	6	8	0.19
40	12.1	50	5	7	0.19
52	12.1	50	5	7	0.19
61	12.1	50	4	6	0.19





NYY 0.6/1(1.2) kV

SPLN 43-1/IEC 60502-1

Copper conductor, PVC insulated and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — Control cable 2.5 mm2

No of cores	No of wire and conductor shape		Nominal Thickness		Approximately		Bending radius min	Standard delivery length
			Insulation	Outer sheath	Overall diameter	Net Weight		
pcs	pcs	-	mm			Kg/Km	mm	m
7	1	re	0.8	1.8	17	423	210	500
7	7	rm	0.8	1.8	18	451	220	500
8	1	re	0.8	1.8	18	470	220	500
8	7	rm	0.8	1.8	19	502	230	500
10	1	re	0.8	1.8	20	569	240	500
10	7	rm	0.8	1.8	21	608	260	500
12	1	re	0.8	1.8	21	640	260	500
12	7	rm	0.8	1.8	22	685	270	500
14	1	re	0.8	1.8	22	717	270	500
14	7	rm	0.8	1.8	23	767	280	500
16	1	re	0.8	1.8	23	805	280	500
16	7	rm	0.8	1.8	24	861	290	500
19	1	re	0.8	1.8	24	905	290	500
19	7	rm	0.8	1.8	25	970	300	500
21	1	re	0.8	1.8	25	984	300	500
21	7	rm	0.8	1.8	26	1,055	320	500
24	1	re	0.8	1.8	27	1,115	330	500
24	7	rm	0.8	1.8	29	1,195	350	500
30	1	re	0.8	1.8	29	1,326	350	500
30	7	rm	0.8	1.8	30	1,422	360	500
40	1	re	0.8	1.9	32	1,704	390	500
40	7	rm	0.8	1.9	34	1,829	410	500
52	1	re	0.8	2.0	36	2,193	440	500
52	7	rm	0.8	2.0	38	2,355	460	500
61	1	re	0.8	2.1	38	2,529	460	500
61	7	rm	0.8	2.1	40	2,716	480	500



ELECTRICAL DATA

No of cores	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
pcs	Ω/Km	MΩ.Km	A		kA
7	7.41	50	16	19	0.32
8	7.41	50	16	19	0.32
10	7.41	50	13	16	0.32
12	7.41	50	13	16	0.32
14	7.41	50	12	14	0.32
16	7.41	50	12	14	0.32
19	7.41	50	11	12	0.32
21	7.41	50	11	12	0.32
24	7.41	50	10	11	0.32
30	7.41	50	10	11	0.32
40	7.41	50	8	9	0.32
52	7.41	50	8	9	0.32
61	7.41	50	7	8	0.32



NYY 0.6/1(1.2) kV

SPLN 43-1/IEC 60502-1

Copper conductor, PVC insulated and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **Control cable 4 mm2**

No of cores	No of wire and conductor shape		Nominal Thickness		Approximately		Bending radius min	Standard delivery length
			Insulation	Outer sheath	Overall diameter	Net Weight		
pcs	pcs	-	mm			Kg/Km	mm	m
7	1	re	1.0	1.8	20	596	240	500
7	7	rm	1.0	1.8	20	639	240	500
8	1	re	1.0	1.8	21	667	260	500
8	7	rm	1.0	1.8	22	715	270	500
10	1	re	1.0	1.8	24	813	290	500
10	7	rm	1.0	1.8	25	873	300	500
12	1	re	1.0	1.8	24	924	290	500
12	7	rm	1.0	1.8	26	993	320	500
14	1	re	1.0	1.8	26	1,042	320	500
14	7	rm	1.0	1.8	27	1,121	330	500
16	1	re	1.0	1.8	27	1,180	330	500
16	7	rm	1.0	1.8	28	1,268	340	500
19	1	re	1.0	1.8	28	1,333	340	500
19	7	rm	1.0	1.8	30	1,435	360	500
21	1	re	1.0	1.8	29	1,454	350	500
21	7	rm	1.0	1.8	31	1,566	380	500
24	1	re	1.0	1.9	33	1,706	400	500
24	7	rm	1.0	1.9	35	1,836	420	500
30	1	re	1.0	2.0	35	2,049	420	500
30	7	rm	1.0	2.0	37	2,206	450	500
40	1	re	1.0	2.1	39	2,639	470	500
40	7	rm	1.0	2.1	41	2,843	500	500
52	1	re	1.0	2.3	45	3,424	540	500
52	7	rm	1.0	2.3	47	3,690	570	500
61	1	re	1.0	2.4	47	3,952	570	500
61	7	rm	1.0	2.4	50	4,259	600	500



ELECTRICAL DATA

No of cores	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
pcs	Ω/Km	MΩ.Km	A		kA
7	4.61	50	22	24	0.50
8	4.61	50	22	24	0.50
10	4.61	50	18	20	0.50
12	4.61	50	18	20	0.50
14	4.61	50	17	18	0.50
16	4.61	50	17	18	0.50
19	4.61	50	15	16	0.50
21	4.61	50	15	16	0.50
24	4.61	50	13	14	0.50
30	4.61	50	13	14	0.50
40	4.61	50	11	12	0.50
52	4.61	50	11	12	0.50
61	4.61	50	10	11	0.50



NYY 0.6/1(1.2) kV

SPLN 43-1/IEC 60502-1

Copper conductor, PVC insulated and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **Control cable 6 mm2**

No of cores	No of wire and conductor shape		Nominal Thickness		Approximately		Bending radius min	Standard delivery length
			Insulation	Outer sheath	Overall diameter	Net Weight		
pcs	pcs	-	mm			Kg/Km	mm	m
7	1	re	1.0	1.8	21	751	260	500
7	7	rm	1.0	1.8	22	804	270	500
8	1	re	1.0	1.8	22	842	270	500
8	7	rm	1.0	1.8	24	903	290	500
10	1	re	1.0	1.8	26	1,032	320	500
10	7	rm	1.0	1.8	27	1,107	330	500
12	1	re	1.0	1.8	26	1,182	320	500
12	7	rm	1.0	1.8	28	1,268	340	500
14	1	re	1.0	1.8	28	1,340	340	500
14	7	rm	1.0	1.8	29	1,438	350	500
16	1	re	1.0	1.8	29	1,518	350	500
16	7	rm	1.0	1.8	31	1,628	380	500
19	1	re	1.0	1.9	31	1,746	380	500
19	7	rm	1.0	1.9	33	1,874	400	500
21	1	re	1.0	1.9	33	1,945	400	500
21	7	rm	1.0	1.9	35	2,088	420	500
24	1	re	1.0	2.0	36	2,220	440	500
24	7	rm	1.0	2.0	38	2,384	460	500
30	1	re	1.0	2.1	38	2,689	460	500
30	7	rm	1.0	2.1	41	2,888	500	500
40	1	re	1.0	2.3	43	3,551	520	500
40	7	rm	1.0	2.3	46	3,814	560	500
52	1	re	1.0	2.5	49	4,539	590	500
52	7	rm	1.0	2.5	52	4,876	630	500
61	1	re	1.0	2.6	52	5,248	630	500
61	7	rm	1.0	2.6	55	5,637	660	500



ELECTRICAL DATA

No of cores	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
pcs	Ω/Km	MΩ.Km	A		kA
7	3.08	50	28	31	0.73
8	3.08	50	28	31	0.73
10	3.08	50	24	26	0.73
12	3.08	50	24	26	0.73
14	3.08	50	22	23	0.73
16	3.08	50	22	23	0.73
19	3.08	50	19	20	0.73
21	3.08	50	19	20	0.73
24	3.08	50	17	18	0.73
30	3.08	50	17	18	0.73
40	3.08	50	15	16	0.73
52	3.08	50	15	16	0.73
61	3.08	50	13	14	0.73



NYRY 0.6/1 kV

IEC 60502-1

Copper conductor, PVC insulated, Aluminium wire armoured and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **1 Core**

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Dia of ALwire armour	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
mm²	pcs	-	mm			mm		Kg/Km	mm	m
25	7	rm	1.2	0.9	1.8	10.9	17	534	210	1,000
35	7	rm	12	0.9	1.8	12.0	18	650	220	1,000
50	19	rm	1.4	1.25	1.8	13.7	21	845	260	1,000
70	19	rm	1.4	1.25	1.8	15.5	23	1,088	280	1,000
85	19	rm	1.6	1.25	1.8	17.8	25	1,403	300	1,000
120	37	rm	1.6	1.6	1.8	19.4	27	1,722	330	1,000
150	37	rm	1.8	1.6	1.8	21.4	29	2,045	350	1,000
185	37	rm	2.0	1.6	1.8	23.5	31	2,457	380	1,000
240	61	rm	2.2	1.6	1.9	26.5	34	3,113	410	1,000
300	61	rm	2.4	2.0	2.0	29.3	38	3,866	460	1,000
400	61	rm	2.6	2.0	2.1	33.0	42	4,825	510	500
500	61	rm	2.8	2.0	2.2	36.6	46	5,965	560	500

ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C				Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR		In GROUND		
			⁂	⊙⊙⊙	⁂	⊙⊙⊙	
mm²	Ω/Km	MΩ.Km	A		A		kA
25	0.727	50	126	129	128	133	2.96
35	0.524	40	152	159	153	159	4.13
50	0.387	40	186	189	181	189	5.87
70	0.268	30	233	240	221	232	8.19
95	0.193	30	285	294	265	278	11.09
120	0.153	30	334	344	303	319	13.98
150	0.124	30	375	388	334	352	17.46
185	0.0991	30	429	445	375	398	21.50
240	0.0754	30	492	508	424	448	27.86
300	0.0601	30	591	623	493	531	34.79
400	0.0470	30	653	693	531	577	41.50
500	0.0366	20	787	856	629	699	51.84





NYRGbY & NYFGbY 0.6/1(1.2) kV

SPLN 43-2/IEC 60502-1

Copper conductor, PVC insulated, Galvanized round steel wire or flat steel wire armoured and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **2 Cores**

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Galv.steel wire armour	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
mm²	pcs	-	mm			mm		Kg/Km	mm	m
NYRGbY										
10	7	rm	1.0	0.9	1.8	14.2	21	877	260	1,000
16	7	rm	1.0	0.9	1.8	16.3	23	1,108	280	1,000
25	7	rm	1.2	1.6	1.8	19.7	28	1,778	340	1,000
35	7	rm	1.2	1.6	1.8	22.0	30	2,126	360	1,000
50	19	rm	1.4	1.6	1.8	25.4	33	2,627	400	1,000
70	19	rm	1.4	2.0	1.9	29.0	39	3,572	460	1,000
95	19	rm	1.6	2.0	2.2	33.9	44	4,637	530	1,000
120	37	rm	1.6	2.0	2.3	37.1	47	5,449	570	1,000
150	37	rm	1.8	2.5	2.4	41.0	52	6,859	630	1,000
185	37	rm	2.0	2.5	2.6	45.8	57	8,224	690	1,000
240	61	rm	2.2	2.5	2.8	51.8	64	10,205	770	1,000
300	61	rm	2.4	2.5	2.9	57.7	70	12,282	840	1,000
NYFGbY										
25	7	rm	1.2	0.8	1.8	19.7	26	1,522	320	1,000
35	7	rm	1.2	0.8	1.8	22.0	28	1,857	340	1,000
50	19	rm	1.4	0.8	1.9	25.4	32	2,330	390	1,000
70	19	rm	1.4	0.8	2.0	29.4	36	3,055	440	1,000
95	19	rm	1.6	0.8	2.1	33.9	41	3,943	500	500
120	37	rm	1.6	0.8	2.2	37.1	44	4,681	590	500
150	37	rm	1.8	0.8	2.3	41.4	49	5,670	590	500
185	37	rm	2.0	0.8	2.5	45.8	54	6,849	650	500
240	61	rm	2.2	0.8	2.7	51.8	60	8,679	720	300
300	61	rm	2.4	0.8	2.8	57.7	66	10,577	800	300





ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
mm²	Ω/Km	MΩ.Km	A		kA
10	1.83	50	65	77	1.20
16	1.15	40	89	101	1.91
25	0.727	40	119	113	2.96
35	0.524	40	148	158	4.13
50	0.387	30	178	185	5.87
70	0.268	30	228	228	8.19
95	0.193	30	272	277	11.09
120	0.153	30	317	317	13.98
150	0.124	20	371	351	17.46
185	0.0991	20	426	405	21.50
240	0.0754	20	505	467	27.86
300	0.0601	20	584	520	34.79



NYRGbY & NYFGbY 0.6/1(1.2) kV

SPLN 43-2/IEC 60502-1

Copper conductor, PVC insulated, Galvanized round steel wire or flat steel wire armoured and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **3 Cores**

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Galv. steel wire armour	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
mm^2	pcs	-	mm			mm		Kg/Km	mm	m
NYRGbY										
10	7	rm	1.0	0.9	1.8	15.2	22	1,008	270	1,000
16	7	rm	1.0	0.9	1.8	17.4	24	1,294	290	1,000
25	7	rm	1.2	1.6	1.8	21.1	29	2,089	350	1,000
35	7	rm	1.2	1.6	1.8	23.5	32	2,526	390	1,000
35	19	sm	1.2	1.6	1.8	20.7	29	2,158	350	1,000
50	19	sm	1.4	2.0	2.0	23.5	32	2,692	390	1,000
70	19	sm	1.4	2.0	2.0	26.8	36	3,687	440	1,000
95	19	sm	1.6	2.0	2.3	30.9	41	4,771	500	500
120	37	sm	1.6	2.0	2.4	33.4	43	5,634	520	500
150	37	sm	1.8	2.5	2.5	37.3	49	7,144	590	500
185	37	sm	2.0	2.5	2.7	41.1	53	8,526	640	300
240	37	sm	2.2	2.5	2.9	46.7	59	10,694	710	300
300	37	sm	2.4	2.5	3.1	51.6	64	12,916	770	250
NYFGbY										
25	7	rm	1.2	0.8	1.8	21.1	28	1,811	340	1,000
35	7	rm	1.2	0.8	1.8	23.5	30	2,235	360	1,000
35	19	sm	1.2	0.8	1.8	20.7	27	1,896	330	1,000
50	19	sm	1.4	0.8	1.9	23.5	30	2,391	360	1,000
70	19	sm	1.4	0.8	2.0	26.8	34	3,139	410	1,000
95	19	sm	1.6	0.8	2.2	30.9	38	4,128	460	1,000
120	37	sm	1.6	0.8	2.3	33.4	41	4,939	500	500
150	37	sm	1.8	0.8	2.4	37.3	45	5,972	540	500
185	37	sm	2.0	0.8	2.6	41.1	49	7,271	590	500
240	37	sm	2.2	0.8	2.8	46.7	55	9,298	660	300
300	37	sm	2.4	0.8	3.0	51.6	60	11,384	720	300

ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
mm^2	Ω/Km	MΩ.Km	A		kA
10	1.83	50	59	68	1.20
16	1.15	50	79	88	1.91
25	0.727	40	104	115	2.96
35	0.524	40	129	136	4.13
50	0.387	30	158	163	5.87
70	0.268	30	198	203	8.19
95	0.193	30	242	242	11.09
120	0.153	30	282	282	13.98
150	0.124	20	322	312	17.46
185	0.0991	20	366	351	21.50
240	0.0754	20	430	411	27.86
300	0.0601	20	595	460	34.79







NYRGbY & NYFGbY 0.6/1(1.2) kV

SPLN 43-2/IEC 60502-1

Copper conductor, PVC insulated, Galvanized round steel wire or flat steel wire armoured and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **3Cores + 1 ground**

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Galv. steel wire armour	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
mm^2	pcs	-	mm			mm		Kg/Km	mm	m
NYRGbY										
3 x 50 + 25	19/7	sm/rm	1.4/1.2	2.0	2.0	27.4	37	1,420	450	1,000
3 x 70 + 35	19/7	sm/rm	1.4/1.2	2.0	2.1	31.2	41	4,369	500	1,000
3 x 95 + 50	19/19	sm/rm	1.6/1.4	2.0	2.2	35.2	45	5,545	540	500
3 x 120 + 70	37/19	sm/rm	1.6/1.4	2.5	2.3	39.0	50	7,105	600	500
3 x 150 + 70	37/19	sm/rm	1.8/1.4	2.5	2.5	43.4	55	8,316	660	500
3 x 185 + 95	37/19	sm/rm	2.0/1.6	2.5	2.6	47.2	59	9,986	710	300
3 x 240 + 120	37/37	sm/rm	2.2/1.6	2.5	2.8	53.5	65	12,477	780	300
3 x 300 + 150	37/37	sm/rm	2.4/1.8	2.5	3.0	58.9	71	15,026	860	250
NYFGbY										
3 x 50 + 25	19/7	sm/rm	1.4/1.2	0.8	2.0	27.4	34	2,847	410	1,000
3 x 70 + 35	19/7	sm/rm	1.4/1.2	0.8	2.1	31.2	38	3,746	460	1,000
3 x 95 + 50	19/19	sm/rm	1.6/1.4	0.8	2.2	35.2	42	4,848	510	500
3 x 120 + 70	37/19	sm/rm	1.6/1.4	0.8	2.3	39.0	46	5,971	560	500
3 x 150 + 70	37/19	sm/rm	1.8/1.4	0.8	2.5	43.4	51	7,061	620	500
3 x 185 + 95	37/19	sm/rm	2.0/1.6	0.8	2.6	47.2	55	8,584	660	500
3 x 240 + 120	37/37	sm/rm	2.2/1.6	0.8	2.8	53.5	62	10,927	750	500
3 x 300 + 150	37/37	sm/rm	2.4/1.8	0.8	3.0	58.9	68	13,340	820	200





ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
mm^2	Ω/Km	MΩ.Km	A		kA
3 x 50 + 25	0.387/0.727	30	158	163	5.87
3 x 70 + 35	0.268/0.524	30	198	203	8.19
3 x 95 + 50	0.193/0.387	30	242	242	11.09
3 x 120 + 70	0.153/0.268	30	282	282	13.98
3 x 150 + 70	0.124/0.268	20	322	312	17.46
3 x 185 + 95	0.0991/0.193	20	366	351	21.50
3 x 240 + 120	0.0754/0.153	20	430	411	27.86
3 x 300 + 150	0.0601/0.124	20	495	460	34.79



NYRGbY & NYFGbY 0.6/1(1.2) kV

SPLN 43-2/IEC 60502-1

Copper conductor, PVC insulated, Galvanized round steel wire or flat steel wire armoured and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **4 Cores**

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Galv.steel wire armour	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
mm²	pcs	-	mm			mm		Kg/Km	mm	m
NYRGbY										
10	7	rm	1.0	0.9	1.8	16.7	23	1,177	280	1,000
16	7	rm	1.0	1.6	1.8	19.3	27	1,807	330	1,000
25	7	rm	1.2	1.6	1.8	23.4	32	2,467	390	1,000
35	7	rm	1.2	1.6	1.9	26.1	34	3,021	410	1,000
35	19	sm	1.2	1.6	1.9	24.0	32	2,741	390	1,000
50	19	sm	1.4	2.0	2.1	27.8	37	3,731	450	1,000
70	19	sm	1.4	2.0	2.2	31.2	41	4,730	500	1,000
95	19	sm	1.6	2.5	2.4	35.2	46	6,427	560	500
120	37	sm	1.6	2.5	2.5	39.0	50	7,667	600	500
150	37	sm	1.8	2.5	2.7	43.4	55	9,168	660	500
185	37	sm	2.0	2.5	2.9	47.6	60	11,034	720	500
240	37	sm	2.2	2.5	3.1	53.5	66	13,817	600	500
300	37	sm	2.4	2.5	3.3	58.9	72	16,702	870	200
NYFGbY										
16	7	rm	1.0	0.8	1.8	19.3	26	1,567	320	1,000
25	7	sm	1.2	0.8	1.8	23.4	30	2,176	360	1,000
35	7	rm	1.2	0.8	1.9	26.1	33	2,691	400	1,000
35	19	sm	1.2	0.8	1.9	24.0	31	2,433	380	1,000
50	19	sm	1.4	0.8	2.0	27.8	35	3,141	420	1,000
70	19	sm	1.4	0.8	2.1	31.2	38	4,086	460	1,000
95	19	sm	1.6	0.8	2.3	35.2	43	5,352	520	500
120	37	sm	1.6	0.8	2.4	39.0	47	6,506	570	500
150	37	sm	1.8	0.8	2.6	43.4	51	7,885	620	500
185	37	sm	2.0	0.8	2.8	47.8	56	9,624	680	500
240	37	sm	2.2	0.8	3.0	53.5	62	12,232	750	500
300	37	sm	2.4	0.8	3.2	58.9	68	14,978	820	200





ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
mm²	Ω/Km	MΩ.Km	A		kA
10	1.83	50	59	68	1.20
16	1.15	40	79	88	1.91
25	0.727	40	104	115	2.96
35	0.524	40	129	136	4.13
50	0.387	30	158	163	5.87
70	0.268	30	198	203	8.19
95	0.193	30	242	242	11.09
120	0.153	30	282	282	13.98
150	0.124	20	322	312	17.46
185	0.0991	20	366	351	21.50
240	0.0754	20	430	411	27.86
300	0.0601	20	595	460	34.79



NYRGbY & NYFGbY 0.6/1(1.2) kV

SPLN 43-2/IEC 60502-1

Copper conductor, PVC insulated, Galvanized round steel wire or flat steel wire armoured and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — 5 Cores

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Galv. steel wire armour	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
mm²	pcs	-	mm			mm		Kg/Km	mm	m
NYRGbY										
10	7	rm	1.0	1.6	1.8	18.5	27	1,649	330	1,000
16	7	rm	1.0	1.6	1.9	21.3	30	2,124	360	1,000
25	7	rm	1.2	1.6	2.0	25.9	34	2,929	410	1,000
35	7	rm	1.2	2.0	2.0	28.9	38	3,820	460	1,000
50	19	rm	1.4	2.0	2.1	34.0	43	4,877	520	1,000
NYFGbY										
16	7	rm	1.0	0.8	1.8	21.3	280	1,830	340	1,000
25	7	rm	1.2	0.8	1.9	25.9	330	2,589	400	1,000
35	7	rm	1.2	0.8	2.0	28.9	360	3,248	440	1,000
50	19	rm	1.4	0.8	2.1	34.0	410	4,205	500	1,000





ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
mm²	Ω/Km	MΩ.Km	A		kA
10	1.83	50	59	68	1.20
16	1.15	40	79	88	1.91
25	0.727	40	104	115	2.96
35	0.524	40	129	136	4.13
50	0.387	30	158	163	5.87



NYRGbY & NYFGbY 0.6/1(1.2) kV

SPLN 43-2/IEC 60502-1

Copper conductor, PVC insulated, Galvanized round steel wire or flat steel wire armoured and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA

Control cable 1.5 mm2

No of cores	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Galv.steel wire armour	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
pcs	pcs	-	mm			mm		Kg/Km	mm	m
NYRGbY										
7	1	re	0.8	0.9	1.8	11.4	18	578	220	500
7	7	rm	0.8	0.9	1.8	11.8	18	595	220	500
8	1	re	0.8	0.9	1.8	12.4	19	629	230	500
8	7	rm	0.8	0.9	1.8	12.8	19	651	230	500
10	1	re	0.8	0.9	1.8	14.5	21	740	260	500
10	7	rm	0.8	0.9	1.8	15.0	22	766	270	500
12	1	re	0.8	0.9	1.8	14.9	21	801	260	500
12	7	rm	0.8	0.9	1.8	15.5	22	828	270	500
14	1	re	0.8	0.9	1.8	15.7	22	871	270	500
14	7	rm	0.8	0.9	1.8	16.3	23	901	280	500
16	1	re	0.8	0.9	1.8	16.6	23	953	280	500
16	7	rm	0.8	0.9	1.8	17.3	24	984	290	500
19	1	re	0.8	1.6	1.8	17.5	26	1,329	320	500
19	7	rm	0.8	1.6	1.8	18.2	26	1,372	320	500
21	1	re	0.8	1.6	1.8	18.4	27	1,422	330	500
21	7	rm	0.8	1.6	1.8	19.2	27	1,467	330	500
24	1	re	0.8	1.6	1.8	20.5	29	1,591	350	500
24	7	rm	0.8	1.6	1.8	21.4	29	1,640	350	500
30	1	re	0.8	1.6	1.8	21.8	30	1,777	360	500
30	7	rm	0.8	1.6	1.8	22.7	31	1,831	380	500
40	1	re	0.8	2.0	1.9	24.5	34	2,342	410	500
40	7	rm	0.8	2.0	1.9	25.5	35	2,414	420	500
52	1	re	0.8	2.0	2.1	28.3	38	2,860	460	500
52	7	rm	0.8	2.0	2.1	29.5	39	2,971	470	500
61	1	re	0.8	2.0	2.1	30.1	40	3,169	480	500
61	7	rm	0.8	2.0	2.1	31.3	41	3,288	500	500
NYFGbY										
21	1	re	0.8	0.8	1.8	18.4	25	1,173	300	500
21	7	rm	0.8	0.8	1.8	19.2	26	1,227	320	500
24	1	re	0.8	0.8	1.8	20.5	27	1,329	330	500
24	7	rm	0.8	0.8	1.8	21.4	28	1,362	340	500
30	1	re	0.8	0.8	1.8	21.8	28	1,483	340	500
30	7	rm	0.8	0.8	1.8	22.7	29	1,547	350	500
40	1	re	0.8	0.8	1.9	24.5	31	1,819	380	500
40	7	rm	0.8	0.8	1.9	25.5	32	1,892	390	500
52	1	re	0.8	0.8	2.0	28.3	35	2,270	420	500
52	7	rm	0.8	0.8	2.0	29.5	36	2,356	440	500
61	1	re	0.8	0.8	2.1	30.1	37	2,546	450	500
61	7	rm	0.8	0.8	2.1	31.3	38	2,640	460	500





ELECTRICAL DATA

No of cores	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
pcs	Ω/Km	MΩ.Km	A		kA
7	12.1	50	10	14	0.19
8	12.1	50	10	14	0.19
10	12.1	50	9	12	0.19
12	12.1	50	9	12	0.19
14	12.1	50	8	10	0.19
16	12.1	50	8	10	0.19
19	12.1	50	7	9	0.19
21	12.1	50	7	9	0.19
24	12.1	50	6	8	0.19
30	12.1	50	6	8	0.19
40	12.1	50	5	7	0.19
50	12.1	50	5	7	0.19
61	12.1	50	4	6	0.19







NYRGbY & NYFGbY 0.6/1(1.2) kV

SPLN 43-2/IEC 60502-1

Copper conductor, PVC insulated, Galvanized round steel wire or flat steel wire armoured and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **Control cable 2.5 mm2**

No of cores	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Galv.steel wire armour	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
pcs	pcs	-	mm			mm		Kg/Km	mm	m
NYRGbY										
7	1	re	0.8	0.9	1.8	12.6	19	684	230	500
7	7	rm	0.8	0.9	1.8	13.3	20	723	240	500
8	1	re	0.8	0.9	1.8	13.5	20	747	240	500
8	7	rm	0.8	0.9	1.8	14.4	21	794	260	500
10	1	re	0.8	0.9	1.8	16.0	22	891	270	500
10	7	rm	0.8	0.9	1.8	16.9	23	946	280	500
12	1	re	0.8	0.9	1.8	16.5	23	972	280	500
12	7	rm	0.8	0.9	1.8	17.5	24	1,033	290	500
14	1	re	0.8	1.6	1.8	17.4	25	1,356	320	500
14	7	rm	0.8	1.6	1.8	18.5	27	1,442	330	500
16	1	re	0.8	1.6	1.8	18.4	26	1,480	320	500
16	7	rm	0.8	1.6	1.8	19.5	28	1,572	340	500
19	1	re	0.8	1.6	1.8	19.4	28	1,616	340	500
19	7	rm	0.8	1.6	1.8	20.3	29	1,717	350	500
21	1	re	0.8	1.6	1.8	20.4	29	1,714	350	500
21	7	rm	0.8	1.6	1.8	21.7	30	1,838	360	500
24	1	re	0.8	1.6	1.9	22.8	31	1,950	380	500
24	7	rm	0.8	1.6	1.9	24.3	33	2,068	400	500
30	1	re	0.8	1.6	1.9	24.2	33	2,199	400	500
30	7	rm	0.8	1.6	1.9	25.8	34	2,350	410	500
40	1	re	0.8	2.0	2.1	27.3	37	2,916	450	500
40	7	rm	0.8	2.0	2.1	29.0	39	3,099	470	500
52	1	re	0.8	2.0	2.2	31.5	41	3,585	500	500
52	7	rm	0.8	2.0	2.2	33.5	43	3,831	520	500
61	1	re	0.8	2.0	2.3	33.5	43	4,008	520	500
61	7	rm	0.8	2.0	2.3	35.7	46	4,280	560	500
NYFGbY										
16	1	re	0.8	0.8	1.8	18.4	25	1,231	300	500
16	7	rm	0.8	0.8	1.8	19.5	26	1,316	320	500
19	1	re	0.8	0.8	1.8	19.4	26	1,360	320	500
19	7	rm	0.8	0.8	1.8	20.6	27	1,455	330	500
21	1	re	0.8	0.8	1.8	20.4	27	1,468	330	500
21	7	rm	0.8	0.8	1.8	21.7	28	1,544	340	500
24	1	re	0.8	0.8	1.8	22.8	29	1,633	350	500
24	7	rm	0.8	0.8	1.8	24.3	31	1,745	380	500
30	1	re	0.8	0.8	1.9	24.2	31	1,891	380	500
30	7	rm	0.8	0.8	1.9	25.8	33	2,019	400	500
40	1	re	0.8	0.8	2.0	27.3	34	2,326	410	500
40	7	rm	0.8	0.8	2.0	29.0	36	2,509	440	500
52	1	re	0.8	0.8	2.1	31.5	39	2,916	470	500
52	7	rm	0.8	0.8	2.1	33.5	41	3,137	500	500
61	1	re	0.8	0.8	2.2	33.5	41	3,315	500	500
61	7	rm	0.8	0.8	2.2	35.7	43	3,536	520	500

ELECTRICAL DATA

No of cores	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
pcs	Ω/Km	MΩ.Km	A		kA
7	7.41	50	16	19	0.32
8	7.41	50	16	19	0.32
10	7.41	50	13	16	0.32
12	7.41	50	13	16	0.32
14	7.41	50	12	14	0.32
16	7.41	50	12	14	0.32
19	7.41	50	11	12	0.32
21	7.41	50	11	12	0.32
24	7.41	50	10	11	0.32
30	7.41	50	10	11	0.32
40	7.41	50	8	9	0.32
50	7.41	50	8	9	0.32
61	7.41	50	7	8	0.32







NYRGbY & NYFGbY 0.6/1(1.2) kV

SPLN 43-2/IEC 60502-1

Copper conductor, PVC insulated, Galvanized round steel wire or flat steel wire armoured and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **Control cable 4 mm2**

No of cores	No of wire and conductor shape		Nominal Thickness			0.9			Bending radius min	Standard delivery length
			Insulation	Galv.steel wire armour	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
pcs	pcs	-	mm			mm		Kg/Km	mm	m
NYRGbY										
7	1	re	1.0	0.9	1.8	15.2	22	903	270	500
7	7	rm	1.0	0.9	1.8	16.2	23	962	280	500
8	1	re	1.0	1.6	1.8	16.5	25	1,287	300	500
8	7	rm	1.0	1.6	1.8	17.6	26	1,355	320	500
10	1	re	1.0	1.6	1.8	19.5	28	1,524	340	500
10	7	rm	1.0	1.6	1.8	20.8	29	1,621	350	500
12	1	re	1.0	1.6	1.8	20.2	28	1,654	340	500
12	7	rm	1.0	1.6	1.8	21.5	30	1,760	360	500
14	1	re	1.0	1.6	1.9	21.3	30	1,823	360	500
14	7	rm	1.0	1.6	1.9	22.7	31	1,939	380	500
16	1	re	1.0	1.6	1.9	22.6	31	1,998	380	500
16	7	rm	1.0	1.6	1.9	24.0	32	2,140	390	500
19	1	re	1.0	1.6	1.9	23.9	32	2,189	390	500
19	7	rm	1.0	1.6	1.9	25.4	34	2,345	410	500
21	1	re	1.0	1.6	2.0	25.2	34	2,373	410	500
21	7	rm	1.0	1.6	2.0	26.8	35	2,539	420	500
24	1	re	1.0	2.0	2.1	28.6	38	2,974	460	500
24	7	rm	1.0	2.0	2.1	30.4	40	3,162	480	500
30	1	re	1.0	2.0	2.2	30.4	40	3,386	480	500
0	7	rm	1.0	2.0	2.2	32.4	42	3,627	510	500
40	1	re	1.0	2.0	2.3	34.2	44	4,146	530	500
40	7	rm	1.0	2.0	2.3	36.5	46	4,435	560	500
52	1	re	1.0	2.5	2.5	39.4	51	5,537	620	500
52	7	rm	1.0	2.5	2.5	42.0	53	5,931	640	500
61	1	re	1.0	2.5	2.6	40.0	53	6,196	660	500
61	7	rm	1.0	2.5	2.6	44.7	56	6,633	680	500
NYFGbY										
10	1	re	1.0	0.8	1.8	19.5	26	1,269	320	500
10	7	rm	1.0	0.8	1.8	20.8	27	1,359	330	500
12	1	re	1.0	0.8	1.8	20.2	27	1,385	330	500
12	7	rm	1.0	0.8	1.8	21.5	28	1,481	340	500
14	1	re	1.0	0.8	1.8	21.3	28	1,530	340	500
14	7	rm	1.0	0.8	1.8	22.7	29	1,639	350	500
16	1	re	1.0	0.8	1.8	22.6	29	1,697	350	500
16	7	rm	1.0	0.8	1.8	24.0	31	1,816	380	500
19	1	re	1.0	0.8	1.9	23.9	30	1,897	380	500
19	7	rm	1.0	0.8	1.9	25.4	32	2,030	390	500
21	1	re	1.0	0.8	1.9	25.2	32	2,049	390	500
21	7	rm	1.0	0.8	1.9	26.8	34	2,192	410	500
24	1	re	1.0	0.8	2.0	28.6	35	2,359	420	500
24	7	rm	1.0	0.8	2.0	30.4	37	2,547	450	500
30	1	re	1.0	0.8	2.1	30.4	37	2,768	450	500
30	7	rm	1.0	0.8	2.1	32.4	39	2,959	470	500
40	1	re	1.0	0.8	2.2	34.2	41	3,427	500	500
40	7	rm	1.0	0.8	2.2	36.5	44	3,692	530	500
52	1	re	1.0	0.8	2.4	39.4	47	4,337	570	500
52	7	rm	1.0	0.8	2.4	42.0	50	4,663	600	500
61	1	re	1.0	0.8	2.5	40.0	50	4,929	600	500
61	7	rm	1.0	0.8	2.5	44.7	53	5,298	640	500

ELECTRICAL DATA

No of cores	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
pcs	Ω/Km	MΩ.Km	A		kA
7	4.61	50	22	24	0.50
8	4.61	50	22	24	0.50
10	4.61	50	18	20	0.50
12	4.61	50	18	20	0.50
14	4.61	50	17	18	0.50
16	4.61	50	17	18	0.50
19	4.61	50	15	16	0.50
21	4.61	50	15	16	0.50
24	4.61	50	13	14	0.50
30	4.61	50	13	14	0.50
40	4.61	50	11	12	0.50
50	4.61	50	11	12	0.50
61	4.61	50	10	11	0.50



NYRGbY & NYFGbY 0.6/1(1.2) kV

SPLN 43-2/IEC 60502-1

Copper conductor, PVC insulated, Galvanized round steel wire or flat steel wire armoured and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **Control cable 6 mm2**

No of cores	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Galv.steel wire armour	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
pcs	pcs	-	mm			mm		Kg/Km	mm	m
NYRGbY										
7	1	re	1.0	1.6	1.8	16.7	25	1,371	300	500
7	7	rm	1.0	1.6	1.8	17.8	26	1,461	320	500
8	1	re	1.0	1.6	1.8	18.1	26	1,500	320	500
8	7	rm	1.0	1.6	1.8	19.4	27	1,613	330	500
10	1	re	1.0	1.6	1.8	21.5	30	1,798	360	500
10	7	rm	1.0	1.6	1.8	22.9	31	1,926	380	500
12	1	re	1.0	1.6	1.9	22.2	31	1,999	380	500
12	7	rm	1.0	1.6	1.9	23.7	32	2,123	390	500
14	1	re	1.0	1.6	1.9	23.4	32	2,194	390	500
14	7	rm	1.0	1.6	1.9	25.1	33	2,347	400	500
16	1	re	1.0	1.6	2.0	24.8	33	2,418	400	500
16	7	rm	1.0	1.6	2.0	26.6	35	2,584	420	500
19	1	re	1.0	1.6	2.0	26.3	35	2,685	420	500
19	7	rm	1.0	1.6	2.0	28.1	37	2,869	450	500
21	1	re	1.0	2.0	2.1	28.1	38	3,186	460	500
21	7	rm	1.0	2.0	2.1	30.1	40	3,413	480	500
24	1	re	1.0	2.0	2.2	31.5	41	3,612	500	500
24	7	rm	1.0	2.0	2.2	33.7	43	3,861	520	500
30	1	re	1.0	2.0	2.3	33.4	43	4,167	520	500
30	7	rm	1.0	2.0	2.3	35.8	46	4,452	560	500
40	1	re	1.0	2.5	2.5	38.1	49	5,580	590	500
40	7	rm	1.0	2.5	2.5	40.8	52	6,011	630	500
52	1	re	1.0	2.5	2.7	43.4	55	6,830	660	500
52	7	rm	1.0	2.5	2.7	46.6	58	7,337	700	500
61	1	re	1.0	2.5	2.8	46.3	58	7,711	700	500
61	7	rm	1.0	2.5	2.8	49.6	61	8,233	740	500
NYFGbY										
8	1	re	1.0	0.8	1.8	18.1	25	1,267	300	500
8	7	rm	1.0	0.8	1.8	19.4	26	1,358	320	500
10	1	re	1.0	0.8	1.8	21.5	28	1,520	340	500
10	7	rm	1.0	0.8	1.8	22.9	29	1,626	350	500
12	1	re	1.0	0.8	1.8	22.2	29	1,698	350	500
12	7	rm	1.0	0.8	1.8	23.7	30	1,816	360	500
14	1	re	1.0	0.8	1.8	23.4	30	1,886	360	500
14	7	rm	1.0	0.8	1.8	25.1	32	2,016	390	500
16	1	re	1.0	0.8	1.9	24.8	32	2,111	390	500
16	7	rm	1.0	0.8	1.9	26.6	33	2,253	400	500
19	1	re	1.0	0.8	2.0	26.3	33	2,364	400	500
19	7	rm	1.0	0.8	2.0	28.1	35	2,525	420	500
21	1	re	1.0	0.8	2.0	28.1	35	2,596	420	500
21	7	rm	1.0	0.8	2.0	30.1	37	2,772	450	500
24	1	re	1.0	0.8	2.1	31.5	39	2,943	470	500
24	7	rm	1.0	0.8	2.1	33.7	41	3,167	500	500
30	1	re	1.0	0.8	2.2	33.4	41	3,474	500	500
30	7	rm	1.0	0.8	2.2	35.8	43	3,708	520	500
40	1	re	1.0	0.8	2.3	38.1	46	4,411	560	500
40	7	rm	1.0	0.8	2.3	40.8	48	4,735	580	500
52	1	re	1.0	0.8	2.5	43.4	51	5,523	620	500
52	7	rm	1.0	0.8	2.5	46.6	54	5,922	650	500
61	1	re	1.0	0.8	2.6	46.3	54	6,294	650	500
61	7	rm	1.0	0.8	2.6	49.6	58	6,746	700	500





ELECTRICAL DATA

No of cores	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
pcs	Ω/Km	MΩ.Km	A		kA
7	3.08	50	28	30	0.73
8	3.08	50	28	30	0.73
10	3.08	50	24	26	0.73
12	3.08	50	24	26	0.73
14	3.08	50	22	23	0.73
16	3.08	50	22	23	0.73
19	3.08	50	19	20	0.73
21	3.08	50	19	20	0.73
24	3.08	50	17	18	0.73
30	3.08	50	17	18	0.73
40	3.08	50	15	16	0.73
50	3.08	50	15	16	0.73
61	3.08	50	13	14	0.73



NYSY 0.6/1(1.2) kV

IEC 60502-1

Copper conductor, PVC insulated, copper tape screened and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **1 Core**

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Copper Tape	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
mm²	pcs	-	mm			mm		Kg/Km	mm	m
1.5	1	re	0.8	0.1	1.8	10.0	15	299	180	1,000
1.5	7	rm	0.8	0.1	1.8	10.0	15	298	180	1,000
2.5	1	re	0.8	0.1	1.8	10.0	15	305	180	1,000
2.5	7	rm	0.8	0.1	1.8	10.0	15	305	180	1,000
4	1	re	1.0	0.1	1.8	10.0	15	315	180	1,000
4	7	rm	1.0	0.1	1.8	10.0	15	314	180	1,000
6	1	re	1.0	0.1	1.8	10.0	15	327	180	1,000
6	7	rm	1.0	0.1	1.8	10.0	15	327	180	1,000
10	1	re	1.0	0.1	1.8	10.0	15	354	180	1,000
10	7	rm	1.0	0.1	1.8	10.0	15	353	180	1,000
16	7	rm	1.0	0.1	1.8	10.0	15	393	180	1,000
25	7	rm	1.2	0.1	1.8	10.9	16	491	200	1,000
35	7	rm	1.2	0.1	1.8	12.0	17	605	210	1,000
50	19	rm	1.4	0.1	1.8	13.7	19	757	230	1,000
70	19	rm	1.4	0.1	1.8	15.5	20	993	240	1,000
95	19	rm	1.6	0.1	1.8	17.8	23	1,295	280	1,000
120	37	rm	1.6	0.1	1.8	19.4	24	1,552	290	1,000
150	37	rm	1.8	0.1	1.8	21.4	26	1,865	320	1,000
185	37	rm	2.0	0.1	1.8	23.5	28	2,262	340	1,000
240	61	rm	2.2	0.1	1.8	26.5	31	2,882	380	1,000
300	61	rm	2.4	0.1	1.9	29.3	34	3,533	410	1,000
400	61	rm	2.6	0.1	2.0	33.0	38	4,451	460	1,000
500	61	rm	2.8	0.1	2.1	36.6	42	5,554	510	500



ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C				Short circuit current of conductor at 1.0 sec
			In AIR		In GROUND		
	DC conductor max	Insulation min	⁂	⊙⊙⊙	⁂	⊙⊙⊙	
mm²	Ω/Km	MΩ.Km	A		A		kA
1.5	12.1	12	-	16	-	33	0.19
2.5	7.41	10	-	25	-	44	0.32
4	4.61	10	-	45	-	57	0.50
6	3.08	8	-	57	-	73	0.73
10	1.83	6	-	79	-	97	1.20
16	1.15	4	85	99	97	106	1.91
25	0.727	4	118	134	124	137	2.96
35	0.524	3	143	168	149	163	4.13
50	0.387	3	178	203	176	194	5.87
70	0.268	3	223	257	216	238	8.19
95	0.193	3	277	317	260	286	11.09
120	0.153	3	327	371	295	326	13.98
150	0.124	3	376	426	335	370	17.46
185	0.0991	3	436	485	379	414	21.50
240	0.0754	3	525	584	432	476	27.86
300	0.0601	3	604	673	485	546	34.79
400	0.0470	3	733	817	573	626	51.50
500	0.0366	2	851	950	652	723	51.84



NYSY 0.6/1(1.2) kV

IEC 60502-1

Copper conductor, PVC insulated, copper tape screened and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — 2 Cores

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Copper Tape	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
mm²	pcs	-	mm			mm		Kg/Km	mm	m
1.5	1	re	0.8	0.1	1.8	10.0	15	313	180	1,000
1.5	7	rm	0.8	0.1	1.8	10.0	15	311	1801	1,000
2.5	1	re	0.8	0.1	1.8	10.0	15	324	180	1,000
2.5	7	rm	0.8	0.1	1.8	10.0	15	323	180	1,000
4	1	re	1.0	0.1	1.8	10.7	16	370	200	1,000
4	7	rm	1.0	0.1	1.8	11.3	16	398	200	1,000
6	1	re	1.0	0.1	1.8	11.7	17	437	210	1,000
6	7	rm	1.0	0.1	1.8	12.4	17	471	210	1,000
10	1	re	1.0	0.1	1.8	13.3	18	567	220	1,000
10	7	rm	1.0	0.1	1.8	14.2	19	614	230	1,000
16	7	rm	1.0	0.1	1.8	16.3	21	808	260	1,000
25	7	rm	1.2	0.1	1.8	19.7	25	1,142	300	1,000
35	7	rm	1.2	0.1	1.8	22.0	27	1,426	330	1,000
50	19	rm	1.4	0.1	1.8	25.4	30	1,830	360	1,000
70	19	rm	1.4	0.1	1.9	29.0	34	2,440	410	1,000
95	19	rm	1.6	0.1	2.0	33.9	39	3,285	470	1,000
120	37	rm	1.6	0.1	2.1	37.1	43	3,967	520	1,000
150	37	rm	1.8	0.1	2.2	41.0	47	4,819	570	500
185	37	rm	2.0	0.1	2.4	45.8	52	5,975	630	500
240	61	rm	2.2	0.1	2.6	51.8	58	7,674	700	500
300	61	rm	2.4	0.1	2.7	57.7	64	9,466	770	300



ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
mm²	Ω/Km	MΩ.Km	A		kA
1.5	12.1	12	21	27	0.19
2.5	7.41	10	29	36	0.32
4	4.61	10	38	46	0.50
6	3.08	8	47	58	0.73
10	1.83	6	65	77	1.20
16	1.15	5	89	101	1.91
25	0.727	5	119	133	2.96
35	0.524	4	148	158	4.13
50	0.387	4	178	185	5.87
70	0.268	3	228	228	8.19
95	0.193	3	272	277	11.09
120	0.153	3	317	317	13.98
150	0.124	3	371	351	17.46
185	0.0991	3	426	405	21.50
240	0.0754	3	505	467	27.86
300	0.0601	3	584	520	34.79



NYSY 0.6/1(1.2) kV

IEC 60502-1

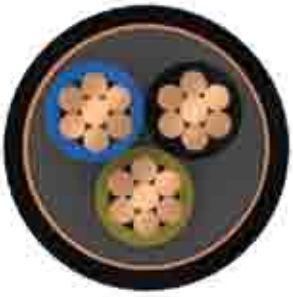
Copper conductor, PVC insulated, copper tape screened and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **3 Cores**

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Copper Tape	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
mm²	pcs	-	mm			mm		Kg/Km	mm	m
1.5	1	re	0.8	0.1	1.8	10.1	15	320	180	1,000
1.5	7	rm	0.8	0.1	1.8	10.1	15	318	180	1,000
2.5	1	re	0.8	0.1	1.8	10.1	15	338	180	1,000
2.5	7	rm	0.8	0.1	1.8	10.1	15	337	180	1,000
4	1	re	1.0	0.1	1.8	11.4	16	423	200	1,000
4	7	rm	1.0	0.1	1.8	12.1	17	454	210	1,000
6	1	re	1.0	0.1	1.8	12.5	17	509	210	1,000
6	7	rm	1.0	0.1	1.8	13.3	18	548	220	1,000
10	1	re	1.0	0.1	1.8	14.2	19	676	230	1,000
10	7	rm	1.0	0.1	1.8	15.2	20	729	240	1,000
16	7	rm	1.0	0.1	1.8	17.5	22	980	270	1,000
25	7	rm	1.2	0.1	1.8	21.2	26	1,405	320	1,000
35	7	rm	1.2	0.1	1.8	23.5	28	1,777	340	1,000
35	7	sm	1.2	0.1	1.8	20.7	26	1,490	320	500
50	19	sm	1.4	0.1	1.8	23.5	28	1,918	340	500
70	19	sm	1.4	0.1	1.9	26.9	32	2,620	390	500
95	19	sm	1.6	0.1	2.1	30.9	36	3,520	440	500
120	37	sm	1.6	0.1	2.2	33.4	39	4,280	470	500
150	37	sm	1.8	0.1	2.3	37.4	43	5,259	520	500
185	37	sm	2.0	0.1	2.5	41.2	47	6,478	570	500
240	37	sm	2.2	0.1	2.7	46.7	53	8,398	640	500
300	37	sm	2.4	0.1	2.9	51.6	59	10,377	710	300

ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductormax	Insulation min	In AIR	In GROUND	
mm²	Ω/Km	MΩ.Km	A		kA
1.5	12.1	12	18	24	0.19
2.5	7.41	10	25	32	0.32
4	4.61	10	34	40	0.50
6	3.08	8	43	51	0.73
10	1.83	6	59	6	1.20
16	1.15	5	79	88	1.91
25	0.727	5	104	115	2.96
35	0.524	4	129	137	4.13
50	0.387	4	158	163	5.87
70	0.268	3	198	203	8.19
95	0.193	3	242	242	11.09
120	0.153	3	282	282	13.98
150	0.124	3	322	312	17.46
185	0.0991	3	366	351	21.50
240	0.0754	3	431	411	27.86
300	0.0601	3	495	460	34.79





NYSY 0.6/1(1.2) kV

IEC 60502-1

Copper conductor, PVC insulated, copper tape screened and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — 4 Cores

Nominal cross-sectional area	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Copper Tape	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
mm²	pcs	-	mm			mm		Kg/Km	mm	m
1.5	1	re	0.8	0.1	1.8	10.0	15	324	180	1,000
1.5	7	rm	0.8	0.1	1.8	10.0	15	321	180	1,000
2.5	1	re	0.8	0.1	1.8	10.4	15	363	180	1,000
2.5	7	rm	0.8	0.1	1.8	10.9	16	387	200	1,000
4	1	re	1.0	0.1	1.8	12.5	17	494	210	1,000
4	7	rm	1.0	0.1	1.8	13.3	18	539	220	1,000
6	1	re	1.0	0.1	1.8	13.7	19	601	230	1,000
6	7	rm	1.0	0.1	1.8	14.6	19	646	230	1,000
10	1	re	1.0	0.1	1.8	15.6	20	810	240	1,000
10	7	rm	1.0	0.1	1.8	16.7	22	872	270	1,000
16	7	rm	1.0	0.1	1.8	19.3	24	1,187	290	1,000
25	7	rm	1.2	0.1	1.8	23.4	28	1,719	340	1,000
35	7	rm	1.2	0.1	1.8	26.1	31	2,191	380	1,000
35	19	sm	1.2	0.1	1.8	24.0	29	1,960	350	1,000
50	19	sm	1.4	0.1	1.9	27.8	33	2,596	400	1,000
70	19	sm	1.4	0.1	2.1	31.2	37	3,498	450	1,000
95	19	sm	1.6	0.1	2.2	35.2	41	4,666	50	500
120	37	sm	1.6	0.1	2.3	39.0	45	5,741	540	500
150	37	sm	1.8	0.1	2.5	43.4	50	7,039	600	500
185	37	sm	2.0	0.1	2.7	47.6	54	8,697	650	500
240	37	sm	2.2	0.1	2.9	53.5	61	11,198	740	300
300	37	sm	2.4	0.1	3.1	58.9	66	13,834	800	300

ELECTRICAL DATA

Nominal cross-sectional area	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
mm²	Ω/Km	MΩ.Km	A		kA
1.5	12.1	12	18	24	0.19
2.5	7.41	10	25	32	0.32
4	4.61	10	34	40	0.50
6	3.08	8	43	51	0.73
10	1.83	6	59	6	1.20
16	1.15	5	79	88	1.91
25	0.727	5	104	115	2.96
35	0.524	4	129	137	4.13
50	0.387	4	158	163	5.87
70	0.268	3	198	203	8.19
95	0.193	3	242	242	11.09
120	0.153	3	282	282	13.98
150	0.124	3	322	312	17.46
185	0.0991	3	366	351	21.50
240	0.0754	3	431	411	27.86
300	0.0601	3	495	460	34.79





NYSY 0.6/1(1.2) kV

IEC 60502-1

Copper conductor, PVC insulated, copper tape screened and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — Control cable 1.5 mm2

No of cores	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Copper Tape	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
pcs	pcs	-	mm			mm		Kg/Km	mm	m
5	1	re	0.8	0.1	1.8	10.5	15	332	180	500
5	7	rm	0.8	0.1	1.8	10.9	16	343	200	500
6	1	re	0.8	0.1	1.8	11.4	16	379	200	500
5	7	rm	0.8	0.1	1.8	11.8	17	391	210	500
7	1	re	0.8	0.1	1.8	11.4	16	383	200	500
7	7	rm	0.8	0.1	1.8	11.8	17	396	210	500
8	1	re	0.8	0.1	1.8	12.4	17	422	210	500
8	7	rm	0.8	0.1	1.8	12.8	18	436	220	500
10	1	re	0.8	0.1	1.8	14.5	19	505	230	500
10	7	rm	0.8	0.1	1.8	15.0	20	523	240	500
12	1	re	0.8	0.1	1.8	14.9	20	557	240	500
12	7	rm	0.8	0.1	1.8	15.5	20	577	240	500
14	1	re	0.8	0.1	1.8	15.7	21	616	260	500
14	7	rm	0.8	0.1	1.8	16.3	21	637	260	500
16	1	re	0.8	0.1	1.8	16.6	21	685	260	500
16	7	rm	0.8	0.1	1.8	17.3	22	709	270	500
19	1	re	0.8	0.1	1.8	17.5	22	758	270	500
19	7	rm	0.8	0.1	1.8	18.2	23	785	280	500
21	1	re	0.8	0.1	1.8	18.4	23	819	280	500
21	7	rm	0.8	0.1	1.8	19.2	24	847	290	500
24	1	re	0.8	0.1	1.8	20.5	25	923	300	500
24	7	rm	0.8	0.1	1.8	21.4	26	956	320	500
30	1	re	0.8	0.1	1.8	21.8	27	1,077	330	500
30	7	rm	0.8	0.1	1.8	22.7	28	1,115	340	500
40	1	re	0.8	0.1	1.8	24.5	29	1,345	350	500
40	7	rm	0.8	0.1	1.8	25.5	30	1,392	360	500
52	1	re	0.8	0.1	1.9	28.3	33	1,725	400	500
52	7	rm	0.8	0.1	1.9	29.5	35	1,785	420	500
61	1	re	0.8	0.1	2.0	30.1	35	1,967	420	500
61	7	rm	0.8	0.1	2.0	31.3	37	2,035	450	500



ELECTRICAL DATA

No of cores	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
pcs	Ω/Km	MΩ.Km	A		kA
5	12.1	12	18	24	0.19
6	12.1	12	11	15	0.19
7	12.1	12	10	14	0.19
8	12.1	12	10	14	0.19
10	12.1	12	9	12	0.19
12	12.1	12	9	12	0.19
14	12.1	12	8	10	0.19
16	12.1	12	8	10	0.19
19	12.1	12	7	9	0.19
21	12.1	12	7	9	0.19
24	12.1	12	6	8	0.19
30	12.1	12	6	8	0.19
40	12.1	12	5	7	0.19
50	12.1	12	5	7	0.19
61	12.1	12	4	6	0.19



NYSY 0.6/1(1.2) kV

IEC 60502-1

Copper conductor, PVC insulated, copper tape screened and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — **Control cable 2.5 mm2**

No of cores	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Copper Tape	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
pcs	pcs	-	mm			mm		Kg/Km	mm	m
5	1	re	0.8	0.1	1.8	11.5	16	401	200	500
5	7	rm	0.8	0.1	1.8	12.2	17	425	210	500
6	1	re	0.8	0.1	1.8	12.6	17	459	210	500
5	7	rm	0.8	0.1	1.8	13.3	18	487	220	500
7	1	re	0.8	0.1	1.8	12.6	17	473	210	500
7	7	rm	0.8	0.1	1.8	13.3	18	504	220	500
8	1	re	0.8	0.1	1.8	13.6	18	524	220	500
8	7	rm	0.8	0.1	1.8	14.4	19	559	230	500
10	1	re	0.8	0.1	1.8	16.0	21	632	260	500
10	7	rm	0.8	0.1	1.8	16.9	22	674	270	500
12	1	re	0.8	0.1	1.8	16.5	21	705	260	500
12	7	rm	0.8	0.1	1.8	17.5	22	753	270	500
14	1	re	0.8	0.1	1.8	17.4	22	785	270	500
14	7	rm	0.8	0.1	1.8	18.5	23	839	280	500
16	1	re	0.8	0.1	1.8	18.4	23	876	280	500
16	7	rm	0.8	0.1	1.8	19.5	24	930	290	500
19	1	re	0.8	0.1	1.8	19.4	24	980	290	500
19	7	rm	0.8	0.1	1.8	20.6	25	1,049	300	500
21	1	re	0.8	0.1	1.8	20.4	25	1,062	300	500
21	7	rm	0.8	0.1	1.8	21.7	27	1,138	330	500
24	1	re	0.8	0.1	1.8	22.8	28	1,202	340	500
24	7	rm	0.8	0.1	1.8	24.3	29	1,287	350	500
30	1	re	0.8	0.1	1.8	24.2	29	1,417	350	500
30	7	rm	0.8	0.1	1.8	25.8	31	1,519	380	500
40	1	re	0.8	0.1	1.9	27.3	32	1,806	390	500
40	7	rm	0.8	0.1	1.9	29.0	34	1,938	410	500
52	1	re	0.8	0.1	2.0	31.5	37	2,311	450	500
52	7	rm	0.8	0.1	2.0	33.5	39	2,480	470	500
61	1	re	0.8	0.1	2.1	33.5	39	2,655	470	500
61	7	rm	0.8	0.1	2.1	35.7	41	2,849	500	500



ELECTRICAL DATA

No of cores	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
pcs	Ω/Km	MΩ.Km	A		kA
5	7.41	10	25	32	0.32
6	7.41	10	17	20	0.32
7	7.41	10	16	19	0.32
8	7.41	10	16	19	0.32
10	7.41	10	13	16	0.32
12	7.41	10	13	16	0.32
14	7.41	10	12	14	0.32
16	7.41	10	12	14	0.32
19	7.41	10	11	12	0.32
21	7.41	10	11	12	0.32
24	7.41	10	10	11	0.32
30	7.41	10	10	11	0.32
40	7.41	10	8	9	0.32
50	7.41	10	8	9	0.32
61	7.41	10	7	8	0.32



NYSY 0.6/1(1.2) kV

IEC 60502-1

Copper conductor, PVC insulated, copper tape screened and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA

Control cable 4 mm2

No of cores	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Copper Tape	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
pcs	pcs	-	mm			mm		Kg/Km	230	m
5	1	re	1.0	0.1	1.8	13.9	19	548	230	500
5	7	rm	1.0	0.1	1.8	14.8	20	585	240	500
6	1	re	1.0	0.1	1.8	15.2	20	633	240	500
5	7	rm	1.0	0.1	1.8	16.2	21	675	280	500
7	1	re	1.0	0.1	1.8	15.2	20	656	340	500
7	7	rm	1.0	0.1	1.8	16.2	21	702	260	500
8	1	re	1.0	0.1	1.8	16.5	21	731	260	500
8	7	rm	1.0	0.1	1.8	17.6	22	783	270	500
10	1	re	1.0	0.1	1.8	19.5	24	888	290	500
10	7	rm	1.0	0.1	1.8	20.8	26	953	320	500
12	1	re	1.0	0.1	1.8	20.2	25	1,002	300	500
12	7	rm	1.0	0.1	1.8	21.5	26	1,078	320	500
14	1	re	1.0	0.1	1.8	21.3	26	1,124	320	500
14	7	rm	1.0	0.1	1.8	22.7	28	1,207	340	500
16	1	re	1.0	0.1	1.8	22.6	27	1,266	330	500
16	7	rm	1.0	0.1	1.8	24.0	29	1,359	350	500
19	1	re	1.0	0.1	1.8	23.9	29	1,424	350	500
19	7	rm	1.0	0.1	1.8	25.4	30	1,531	360	500
21	1	re	1.0	0.1	1.8	25.2	30	1,549	360	500
21	7	rm	1.0	0.1	1.8	26.8	32	1,666	390	500
24	1	re	1.0	0.1	1.9	28.6	24	1,814	410	500
24	7	rm	1.0	0.1	1.9	30.4	26	1,950	440	500
30	1	re	1.0	0.1	2.0	30.4	26	2,163	440	500
30	7	rm	1.0	0.1	2.0	32.4	28	2,327	460	500
40	1	re	1.0	0.1	2.1	34.2	40	2,767	480	500
40	7	rm	1.0	0.1	2.1	36.5	42	2,979	510	500
52	1	re	1.0	0.1	2.3	39.4	15	3,571	540	500
52	7	rm	1.0	0.1	2.3	42.0	48	3,846	580	500
61	1	re	1.0	0.1	2.4	41.9	48	4,108	580	500
61	7	rm	1.0	0.1	2.4	44.7	51	4,425	620	500

ELECTRICAL DATA



No of cores	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
pcs	Ω/Km	MΩ.Km	A		kA
5	3.08	8	43	51	0.50
6	3.08	8	29	32	0.50
7	3.08	8	28	31	0.50
8	3.08	8	28	31	0.50
10	3.08	8	24	26	0.50
12	3.08	8	24	26	0.50
14	3.08	8	22	23	0.50
16	3.08	8	22	213	0.50
19	3.08	8	19	20	0.50
21	3.08	8	19	20	0.50
24	3.08	8	17	18	0.50
30	3.08	8	17	18	0.50
40	3.08	8	15	16	0.50
50	3.08	8	15	16	0.50
61	3.08	8	13	14	0.50



NYSY 0.6/1(1.2) kV

IEC 60502-1

Copper conductor, PVC insulated, copper tape screened and PVC sheathed cable

DIMENSIONAL & MECHANICAL DATA — Control cable 6 mm2

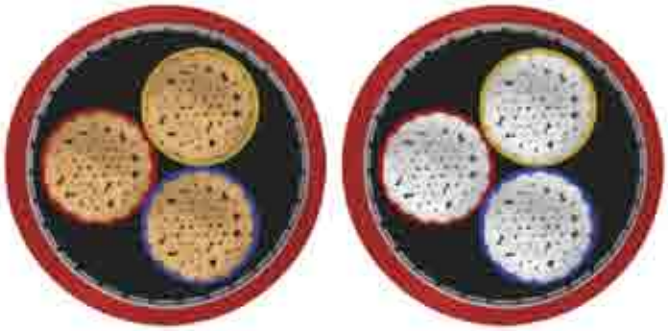
No of cores	No of wire and conductor shape		Nominal Thickness			Approximately			Bending radius min	Standard delivery length
			Insulation	Copper Tape	Outer Sheath	Inner Sheath diameter	Overall Diameter	Net Weight		
pcs	pcs	-	mm			mm		Kg/Km	mm	m
5	1	re	1.0	0.1	1.8	15.2	20	668	240	500
5	7	rm	1.0	0.1	1.8	16.2	21	712	260	500
6	1	re	1.0	0.1	1.8	16.7	22	774	270	500
5	7	rm	1.0	0.1	1.8	17.8	23	838	280	500
7	1	re	1.0	0.1	1.8	16.7	22	816	270	500
7	7	rm	1.0	0.1	1.8	17.8	23	873	280	500
8	1	re	1.0	0.1	1.8	18.1	23	913	280	500
8	7	rm	1.0	0.1	1.8	19.4	24	977	290	500
10	1	re	1.0	0.1	1.8	21.5	26	1,114	320	500
10	7	rm	1.0	0.1	1.8	22.9	28	1,194	340	500
12	1	re	1.0	0.1	1.8	22.2	27	1,267	330	500
12	7	rm	1.0	0.1	1.8	23.7	29	1,358	350	500
14	1	re	1.0	0.1	1.8	23.4	28	1,429	340	500
14	7	rm	1.0	0.1	1.8	25.1	30	1,533	360	500
16	1	re	1.0	0.1	1.8	24.8	30	1,611	360	500
16	7	rm	1.0	0.1	1.8	26.6	31	1,728	380	500
19	1	re	1.0	0.1	1.9	26.3	31	1,845	380	500
19	7	rm	1.0	0.1	1.9	28.1	33	1,980	400	500
21	1	re	1.0	0.1	1.9	28.1	33	2,051	400	500
21	7	rm	1.0	0.1	1.9	30.1	35	2,201	420	500
24	1	re	1.0	0.1	2.0	31.5	37	2,338	450	500
24	7	rm	1.0	0.1	2.0	33.7	39	2,509	470	500
30	1	re	1.0	0.1	2.1	33.4	39	2,814	470	500
30	7	rm	1.0	0.1	2.1	35.8	41	3,021	500	500
40	1	re	1.0	0.1	2.3	38.1	44	3,694	530	500
40	7	rm	1.0	0.1	2.3	40.8	47	3,966	570	500
52	1	re	1.0	0.1	2.5	43.4	50	4,701	600	500
52	7	rm	1.0	0.1	2.5	46.6	53	5,049	640	500
61	1	re	1.0	0.1	2.6	46.3	53	5,420	340	500
61	7	rm	1.0	0.1	2.6	49.6	56	5,821	380	500



ELECTRICAL DATA

No of cores	Resistance at 20 °C		Current Carrying Capacity at 30 °C		Short circuit current of conductor at 1.0 sec
	DC conductor max	Insulation min	In AIR	In GROUND	
pcs	Ω/Km	MΩ.Km	A		kA
5	3.08	8	43	51	0.73
6	3.08	8	29	32	0.73
7	3.08	8	28	31	0.73
8	3.08	8	28	31	0.73
10	3.08	8	24	26	0.73
12	3.08	8	24	26	0.73
14	3.08	8	22	23	0.73
16	3.08	8	22	23	0.73
19	3.08	8	19	20	0.73
21	3.08	8	19	20	0.73
24	3.08	8	17	15	0.73
30	3.08	8	17	15	0.73
40	3.08	8	15	16	0.73
50	3.08	8	15	16	0.73
61	3.08	8	13	14	0.73





NYFGbY/NAYFGbY

3.6/6(7.2) kV

SII 1040

Copper/Aluminium conductor, PVC insulated,
Galvanized flat steel wire armoured,PVC sheathed cable

DIMENSIONAL AND ELECTRICAL DATA — **3 CORES**

Nominal cross-sectional area			mm²	25	35	50	70	95	120	150	185	240	300	400
Conductor diameter (approx)			mm	6.05	7.1	8.25	9.9	11.7	13.1	14.3	16.3	18.2	20.9	23.7
Nominal insulation thickness			mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Insulation diameter (approx)			mm	13.3	13.5	14.5	15.9	17.4	18.5	19.8	21.2	23.2	25.1	27.4
Nominal flat wire armour thickness			mm	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Nominal outer sheath thickness			mm	2.2	2.2	2.2	2.2	2.6	2.6	2.6	2.6	3.0	3.0	3.4
Overall cable diameter (approx)			mm	39	39	41	44	48	51	53	57	62	66	72
Cable net weight (approx)		CU	Kg/Km	2,700	2,800	3,300	4,100	5,100	6,000	6,900	8,100	10,100	12,100	14,900
		AL		-	2,300	2,500	2,800	3,400	3,800	4,200	4,700	5,700	6,500	7,700
Standard length per-reel			m	300	300	300	300	300	300	300	300	300	300	300
Minimum bending radius			mm	290	290	310	330	360	380	400	430	460	570	590
at 20 °C		CU	Ω/Km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
		AL		1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
Min. insulation resistance at 20 °C			MΩ.Km	100	90	80	60	60	50	50	40	40	40	40
Capacitance per phase			μF/Km	0.194	0.177	0.196	0.244	0.253	0.275	0.299	0.328	0.366	0.402	0.466
Iinductance per phase			mH/km	0.372	0.386	0.368	0.347	0.330	0.318	0.309	0.299	0.287	0.279	0.270
Max.short circuit current of conductor		CU	kA/sec	2.95	4.12	5.86	8.18	11.08	13.97	17.44	21.49	27.84	34.77	46.31
		AL		-	2.72	3.87	5.41	7.32	9.13	11.53	14.2	18.40	22.98	30.61
Maximum current carrying capacity at 30 °C	in air	CU	A	110	135	165	205	250	285	325	370	430	490	570
		AL		-	105	130	160	195	220	250	285	340	390	450
	in ground	CU		111	134	156	196	231	263	295	329	378	432	481
		AL		-	102	120	151	178	205	231	258	294	338	376
AC test voltage			kV/5 min	11										

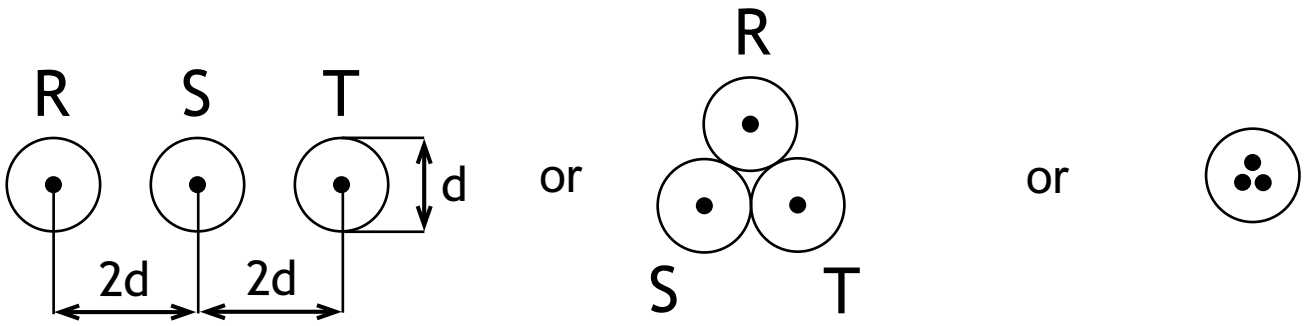


Installation Guide & Derating Factors

Conditions for current carrying capacity

The tabulated current ratings are designed by the conditions as below :

- One circuit of three phase load.



- Load factor = 1.0
- Maximum operating conductor temperature :

  70°C (PVC insulation) and 90°C (XLPE insulation)
  No other heat sources installed near the group of cables.
- Cable laying :

  in air : - Ambient temperature : 30°C

  - The cable have to protected against heat radiation of the sun as well as sufficiently large and ventilated rooms whose temperature is not perceptibly increased by the heat dissipating from the loaded cable.

  in ground :
  - Soil temperature : 30°C
  - Depth of laying : 70 cm
  - Specific thermal resistivity of soil :100°C.cm/Watt

NOTE :

If the actual installed conditions are different from the above mentioned condition, the tabulated current ratings should be multiplied by the appropriate derating factors as shown in tables on the next pages.

DERATING FACTORS

A. Grouping in the ground.

1 Variation in ground temperature.

	Ground temperatures (°C)						
	20	25	30	35	40	45	50
XLPE insulation	1.08	1.04	1.00	0.96	0.91	0.87	0.82
PVC insulation	1.12	1.07	1.00	0.94	0.87	0.79	0.71

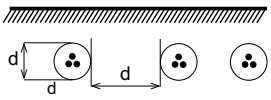
2 Variation in thermal resistivity of soil.

	Thermal resistivity of soil (°C.cm/watt)			
	70	100	150	250
XLPE insulation	1.12	1.0	0.87	0.78
PVC insulation	1.11	1.0	0.82	0.70

3 Variation in depth of laying.

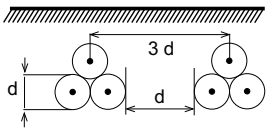
	Depth of laying (cm)					
	50	70	100	120	160	200
XLPE insulation	1.02	1.00	0.98	0.97	0.95	0.94
PVC insulation	1.01	1.00	0.99	0.98	0.97	0.96

4 **GROUPING** of **multicore** cables.



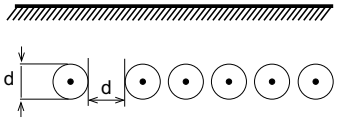
	Number 0f grouping							
	1	2	3	4	5	6	8	10
XLPE insulation	1.00	0.86	0.76	0.71	0.67	0.64	0.60	0.57
PVC insulation	1.00	0.85	0.75	0.68	0.64	0.60	0.56	0.53

5 **GROUPING** of **single core** cables (**Trefoil** formation)



	Number 0f grouping							
	1	2	3	4	5	6	8	10
XLPE insulation	1.00	0.89	0.82	0.78	0.75	0.73	0.70	0.68
PVC insulation	1.00	0.90	0.82	0.79	0.76	0.74	0.71	0.69

6 **GROUPING** of **single core** cables (**Flat** formation)



	Number 0f grouping							
	1	2	3	4	5	6	8	10
XLPE insulation	1.00	0.87	0.77	0.73	0.70	0.68	0.65	0.63
PVC insulation	1.00	0.87	0.78	0.74	0.70	0.68	0.65	0.63

B. Grouping in air.

1 Variation in air temperature.

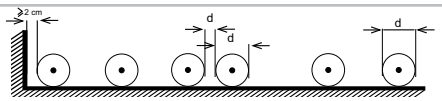
	Air temperatures (°C)							
	20	25	30	35	40	45	50	55
XLPE insulation	1.08	1.04	1.00	0.96	0.91	0.87	0.82	0.76
PVC insulation	1.12	1.07	1.00	0.93	0.87	0.79	0.71	0.61

2 Single core cables in three phase system.

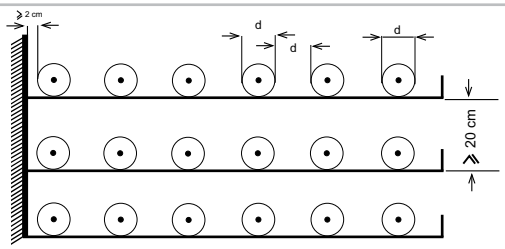
2.1 Flat formation.

Minimum distance from the wall is 2.0 cm. Clearance between systems = Cable diameter (d)	Number of system		
	1	2	3

2.1.1 Laid on the ground in flat formation.

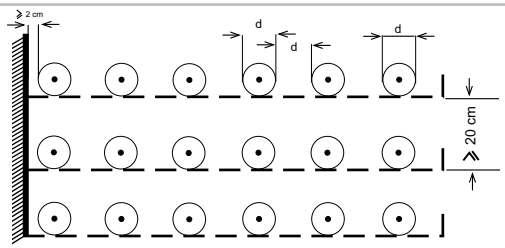
	Derating factor		
	0.92	0.89	0.88

2.1.2 Laid on troughs (air circulation is restricted)



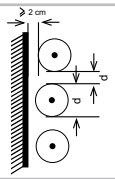
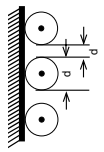
Number of troughs	Derating factor		
1	0.92	0.89	0.88
2	0.87	0.84	0.83
3	0.84	0.82	0.81
6	0.82	0.80	0.79

2.1.3 Laid on the racks in flat formation.



Number of racks	Derating factor		
1	1.00	0.97	0.96
2	0.97	0.94	0.93
3	0.96	0.93	0.92
6	0.94	0.91	0.90

2.1.4 Arranged on structures or on the wall.

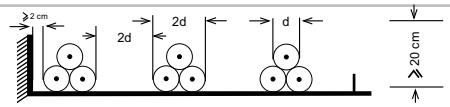
		Derating factor		
		0.94	0.91	0.89
	Touching the wall.	0.89	0.86	0.84

B. Grouping in air (continued)

2.2 Trefoil formation.

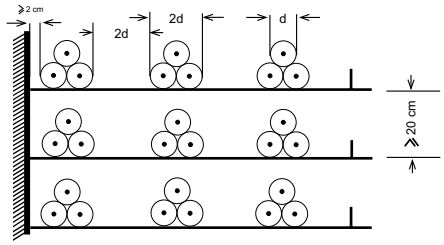
Minimum distance from the wall is 2.0 cm. Clearance between systems = 2 x Cable diameter (2 d)	Number of system		
	1	2	3

2.2.1 Laid on the ground in trefoil formation.



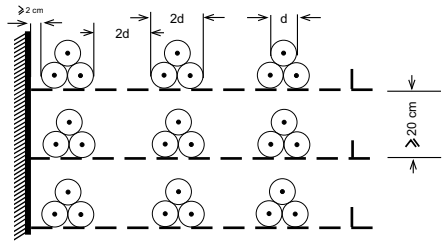
Derating factor		
0.95	0.90	0.88

2.2.2 Laid on troughs (air circulation is restricted)



Number of troughs	Derating factor		
1	0.95	0.90	0.88
2	0.90	8.85	0.83
3	0.88	0.83	0.81
6	0.86	0.81	0.79

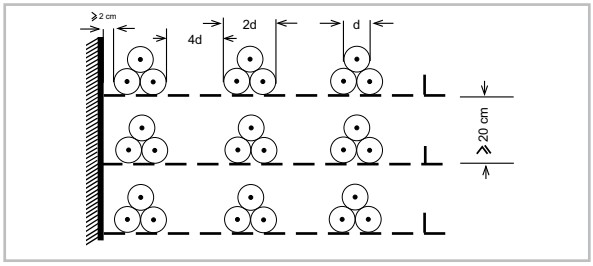
2.2.3 Laid on the racks in trefoil formation.



Number of racks	Derating factor		
1	1.00	0.98	0.96
2	1.00	0.95	0.93
3	1.00	0.94	0.92
6	1.00	0.93	0.90

2.2.4 Arrangement for which a reduction of the current rating is not necessary (for any number of systems)

- Minimum distance from the wall is 2.0 cm.
- Clearance between cables = 4 x cable diameter (4d).



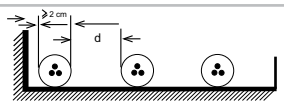
B. Grouping in air (continued).

3 Multicore cables in three phase system and single core cables in DC system.

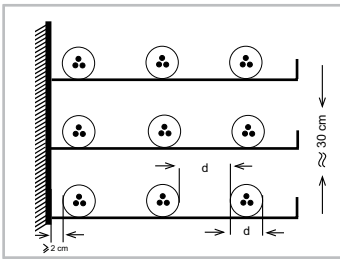
3.1 Minimum distance from the wall is 2.0 cm.
Clearance between cables = Cable diameter (d)

Number of system				
1	2	3	6	9

3.1.1 Laid on the ground in flat formation.

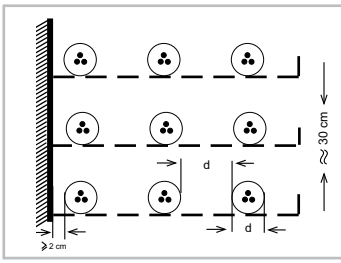
	Derating factor				
	0.95	0.90	0.88	0.85	0.84

3.1.2 Laid on troughs (air circulation is restricted)



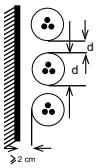
Number of troughs	Derating factor				
1	0.95	0.90	0.88	0.85	0.84
2	0.90	0.85	0.83	0.81	0.80
3	0.88	0.83	0.81	0.79	0.78
6	0.86	0.81	0.79	0.77	0.76

3.1.3 Laid on the racks in flat formation.



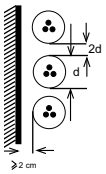
Number of troughs	Derating factor				
1	1.00	0.98	0.96	0.93	0.92
2	1.00	0.95	0.93	0.90	0.89
3	1.00	0.94	0.92	0.89	0.88
6	1.00	0.93	0.90	0.87	0.86

3.1.4 Arranged on structures or on the wall.

	Derating factor				
	1.00	0.93	0.90	0.87	0.86

3.1.5 Arrangement for which a reduction of the current rating is not necessary (for any number of cables)

- Minimum distance from the wall is 2.0 cm.
- Clearance between cables = 2 x cable diameter (2d).

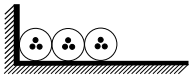


B. Grouping in air (continued).

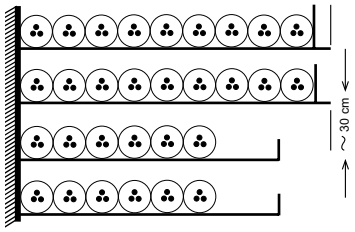
3.2 Cables touching throughout and in contact with the wall.

	Number of system				
	1	2	3	6	9

3.2.1 Laid on the ground in flat formation.

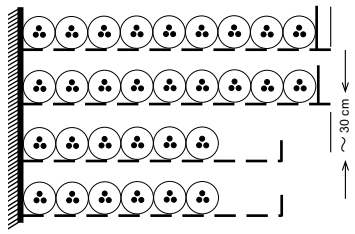
	Derating factor				
	0.90	0.84	0.80	0.75	0.73

3.2.2 Laid on troughs (air circulation is restricted)



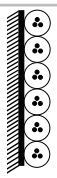
Number of troughs	Derating factor				
1	0.95	0.84	0.80	0.75	0.73
2	0.95	0.80	0.76	0.71	0.69
3	0.95	0.78	0.74	0.70	0.68
6	0.95	0.76	0.72	0.68	0.66

3.2.3 Laid on the racks in flat formation.



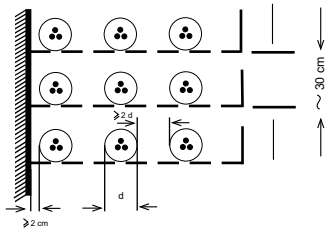
Number of troughs	Derating factor				
1	0.95	0.84	0.80	0.75	0.73
2	0.95	0.80	0.76	0.71	0.69
3	0.95	0.78	0.74	0.70	0.68
6	0.95	0.76	0.72	0.68	0.66

3.2.4 Arranged on structures or on the wall.

	Derating factor				
	0.95	0.78	0.73	0.68	0.66

3.2.5 Arrangement for which a reduction of the current rating is not necessary (for any number of cables)

- Minimum distance from the wall is 2.0 cm.
- Clearance between cables = 2 x cable diameter (2d).



CONVERSION TABLE

Nominal cross sectional area			Wire gauge			
mm^2	Inc^2	Circular Mils (CM)	Equivalent Metric CSA	AWG	BWG	SWG
	0.0005	644	0.325	22	-	-
	0.0006	487	0.397	-	22	22
	0.0006	821	0.416	21	-	-
0.50	0.0008	987	-	-	-	-
	0.0008	1,021	0.517	20	-	-
	0.0008	1,025	0.519	-	21	21
	0.0009	1,198	0.607	-	20	-
	0.0010	1,289	0.653	19	-	-
	0.0010	1,297	0.657	-	-	20
	0.0013	1,601	0.811	-	-	19
0.75	0.0012	1,481	-	-	-	-
	0.0013	1,625	0.823	18	-	-
	0.0014	1,765	0.894	-	19	-
1.0	0.0016	1,974	-	-	-	-
	0.0016	2,053	1.040	17	-	-
	0.0016	2,304	1.167	-	-	18
	0.0019	2,402	1.217	-	18	-
	0.0020	2,584	1.309	16	-	-
1.5	0.0023	2,961	-	-	-	-
	0.0025	3,137	1.589	-	-	17
	0.0026	3,257	1.650	15	-	-
	0.0026	3,366	1.705	-	17	-
	0.0032	4,096	2.075	-	-	16
	0.0032	4,108	2.081	14	-	-
	0.0033	4,226	2.141	-	16	-
2.5	0.0039	4,935	-	-	-	-
	0.0040	5,180	2.624	13	-	-
	0.0040	5,186	2.627	-	15	15
	0.0050	6,402	3.243	-	-	14
	0.0051	6,532	3.309	12	-	-
	0.0054	6,891	3.491	-	14	-
4	0.0062	7,896	-	-	-	-
	0.0065	8,236	4.172	11	-	-
	0.0066	8,466	4.269	-	-	13
	0.0071	9,072	4.573	-	13	-
	0.0082	10,387	5.262	10	-	-
	0.0085	10,819	5.481	-	-	12
	0.0093	11,883	6.020	-	12	-
6	0.0093	11,844	-	-	-	-
	0.0103	13,092	6.632	9	-	-
	0.0106	13,459	6.816	-	-	11
	0.0113	14,404	7.297	-	11	-
	0.0129	16,388	8.302	-	-	10
	0.0130	16,518	8.368	8	-	-
	0.0141	17,959	9.098	-	10	-
10	0.0155	19,740	-	-	-	-
	0.0163	20,766	10.520	-	-	9
	0.0164	20,826	10.550	7	-	-
	0.0172	21,911	11.100	-	9	-
	0.0201	25,603	12.970	-	-	8
	0.0206	26,254	13.300	6	-	-
	0.0214	27,241	13.800	-	8	-
	0.0243	30,992	15.700	-	-	7
16	0.0248	31,584	-	-	-	-
	0.0255	32,413	16.420	-	7	-
	0.0260	33,104	16.770	5	-	-

Nominal cross sectional area			Wire gauge			
mm^2	Inc^2	Circular Mils (CM)	Equivalent Metric CSA	AWG	BWG	SWG
	0.0290	36,874	18.68	-	-	6
	0.0324	41,217	20.88	-	6	-
	0.0326	41,750	21.15	4	-	-
	0.0353	44,948	22.77	-	-	5
	0.0380	48,402	24.52	-	5	-
25	0.0388	49,350	-	-	-	-
	0.0413	52,627	26.66	3	-	-
	0.0423	53,831	27.27	-	-	4
	0.0445	56,654	28.70	-	4	-
	0.0499	63,523	32.18	-	-	3
	0.0521	66,386	33.63	2	-	-
	0.0527	67,096	33.99	-	3	-
35	0.0543	69,090	-	-	-	-
	0.0598	76,196	28.60	-	-	2
	0.0633	80,677	40.87	-	2	-
	0.0657	83,717	42.41	1	-	-
	0.0707	90,014	45.60	-	1	1
50	0.0775	98,700	-	-	-	-
	0.0824	404,997	53.19	-	-	1/0
	0.0829	105,589	53.49	1/0	-	-
	0.0908	115,637	58.58	-	1/0	-
	0.0951	121,125	61.36	-	-	2/0
	0.1045	133,087	67.42	2/0	-	-
70	0.1085	138,180	-	-	-	-
	0.1087	138,417	70.12	-	-	3/
	0.1134	144,438	73.17	-	2/	-
	0.1257	160,032	81.07	-	-	4/0
	0.1318	167,849	85.03	3/0	-	-
	0.1419	180,660	91.52	-	3/0	-
	0.1466	186,661	94.56	-	-	5/0
95	0.1473	187,530	-	-	-	-
	0.1616	206,086	104.40	-	4/0	-
	0.1691	211,613	107.20	4/0	-	-
	0.1860	215,363	109.10	-	-	6/0
120	0.1860	236,880	-	-	-	-
	0.1963	249,987	126.64	-	-	-
	0.1964	250,106	126.70	-	5/0	7/0
	0.2091	266,332	134.92	5/0	-	-
150	0.2325	296,100	-	-	-	-
	0.2356	300,048	152.00	-	-	-
	0.2642	336,488	170.46	6/0	-	-
185	0.2868	365,190	-	-	-	-
	0.3142	400,150	202.71	-	-	-
240	0.3720	473,760	-	-	-	-
	0.3927	500,113	253.35	-	-	-
300	0.4650	592,200	-	-	-	-
	0.4712	600,096	304.00	-	-	-
	0.5498	700,198	354.71	-	-	-
400	0.6200	789,600	-	-	-	-
	0.6283	800,161	405.35	-	-	-
500	0.7750	987,000		-	-	-
	0.7854	1,000,246	506.71	-	-	-
625	0.9688	1,233,750	-	-	-	-
630	0.9765	1,243,620	-	-	-	-
800	1.2400	1,597,200	-	-	-	-
1,000	1.5500	1,974,000	-	-	-	-

Note : • AWG = American Wire Gauge • BWG = Birmingham Wire Gauge • SWG = British Standard Wire Gauge

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Lilac Tinge ★ Mowilex 6B-05C05	Instant Karma ★ Mowilex 8B-04C06	Rose Mary ★ Mowilex 1A-05B05	A Winter's Tale Mowilex 54A-02B
Light Lavender ★ Mowilex 5B-05C05	Bed of Roses ★ Mowilex 9B-05C05	By My Side ★ Mowilex 1A-1B1	Taste of Summer Mowilex 3A-05B0
Love Generation ★ Mowilex 6B-1C1	Helplessly Hoping ★ Mowilex 7B-2C05	Always You ★ Mowilex 1A-2B1	Canter Peach Mowilex 3A-1B05
Crystal Palace ★ Mowilex 6B-2C1	Sea of Love ★ Mowilex 7B-3C05	Thrillseeker Pink ★ Mowilex 1A-3B05	Orange Balland Mowilex 3A-2B05
Simple Love ★ Mowilex 6B-3C1	Pink Martini ★ Mowilex 7B-4C05	Morning Blush ★ Mowilex 9B-4C05	Salmon Roe Mowilex 3A-2B1
Queen's Robe Mowilex 7B-4C2	Pink Frolic ★ Mowilex 7B-4C1	Club Flamingo ★ Mowilex 9B-5C1	Cherry Blossom Mowilex 1A-4B1
Waterloo Sunset Mowilex 7B-4C3	Sweet Farewell Mowilex 7B-5C1	Eye Candy Mowilex 9B-6C1	Radiance Mowilex 1A-6B1
Sweet 16 Mowilex 6B-4C4	Think Pink Mowilex 7B-6C1	Strawberry Fields Mowilex 9B-7C1	Cosmopolitian Mowilex 1A-7B1
Violet Fiesta Mowilex 5B-5C4	Lustral Pink Mowilex 7B-5C3	Cranberry Vodka Mowilex 9B-75C15	Island Corals Mowilex 1A-8B15

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Mowilex 9A-4B05
Sunny Disposition
Mowilex 1D-3A05
Prairie Fields
Mowilex 3D-3A1
Regal Green
Mowilex 7D-3A05
Peace of Mind
Mowilex 3A-3B05
Indian Summer
Mowilex 7A-3B1
Swiss County
Mowilex 8A-2B05
Hide and Seek
Mowilex 9A-5B05
Honey Mustard
Mowilex 1D-4A05
Mountain Dew
Mowilex 3D-4A1
Feeling Groovy
Mowilex 7D-4A05
Flickering Flame
Mowilex 3A-4B05
Autumn Valley
Mowilex 7A-4B05
After Sunrise
Mowilex 9A-6B05
Yellow Submarine
Mowilex A-6A05
Sunflower Petal
Mowilex 1D-5A05
Everlasting Green
Mowilex 5D-6A05
Sprite Twist
Mowilex 7D-6A05
Maldives Sunrise
Mowilex 3A-8B1
Sunflakes
Mowilex 7A-7B05
Vertical Horizons
Mowilex 8A-6B05
Banana Pancakes
Mowilex A-8A05
Lemon Lime
Mowilex 1D-5A1
Springfields
Mowilex 5D-6A1
Safari Teal
Mowilex 7D-6A1
Sweet Bouquet
Mowilex 1A-85B1
Tangerine Dreams
Mowilex 5A-8B1
Brave Heart
Mowilex 7A-7B2
Yellow Canary
Mowilex 1D-7A05
Marigold Mist
Mowilex 2D-4A2
Bayshore View
Mowilex 3D-75A1
Springbok Green
Mowilex 7D-7A2
Age of Elegance
Mowilex 1A-6B35
River Bank
Mowilex 3A-5B4
Cape Point
Mowilex 7A-6B3
Villa Amarillo
Mowilex 1D-7A1
Foggy Green
Mowilex 2D-4A3
Great Plains
Mowilex 3D-7A2
Sea of Grass
Mowilex 7D-3A6
Rooftop Loft
Mowilex 1A-3B6
Sophistication
Mowilex 1A-5B45
Blackforest
Mowilex 5A-3B6
Calypso
Mowilex 1D-7A2
Hidden Creeks
Mowilex 3D-5A4
Spring Resort
Mowilex 3D-6A3
Botanic Gardens
Mowilex 9D-3A65

Cool Wave
Mowilex 9D-1A05

Like a Star
Mowilex 47C-05D05

Starry Night
Mowilex 5C-05D05

Blue Menthol
Mowilex C-05C05

Bashful Blue
Mowilex 2B-1C05

August Beauty
Mowilex 3B-1C05

Body Wave
Mowilex 3B-05

The Better Life
Mowilex 9D-2A05

Green Solitude
Mowilex 1C-1D05

Blue Mirage
Mowilex 9C-1D05

Soft Sky
Mowilex C-1C05

Baby Rafa
Mowilex 2B-2C05

Paradise Blue
Mowilex 3B-2C05

Bare Essence
Mowilex 3B-05



Soft Pear
Mowilex 9D-2A1

Wishing Thinking
Mowilex 1C-2D05

Bombay Sapphire
Mowilex 9C-2D05

The Cove
Mowilex C-2C05

Secret Heart
Mowilex 2B-3C05

Blue Earth
Mowilex 3B-25C05

Amongst Butte
Mowilex 4B-2C



Green Patterns
Mowilex 9D-5A05

Bohemian Green
Mowilex 1C-2D1

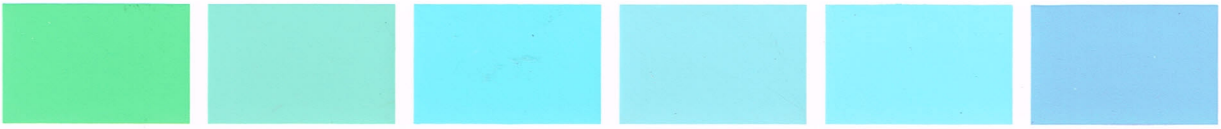
Blue Melody
Mowilex 9C-3D1

Blue Escapades
Mowilex C-3C05

French Blue
Mowilex 1B-3C1

Victoria Falls
Mowilex 2B-3C1

Raisin Cookies
Mowilex 4B-25



Spicy Wasabi
Mowilex 9D-6A05

Start of Spring
Mowilex 1C-3D1

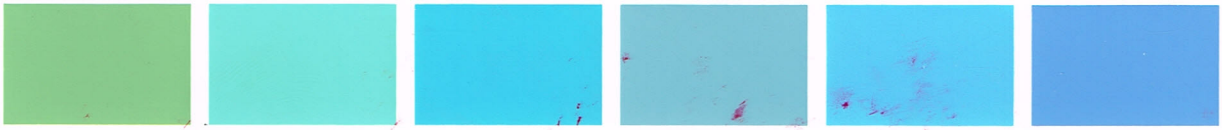
Blue Label
Mowilex 9C-4D05

Satisfy My Soul
Mowilex C-3C1

Mykonos Island
Mowilex 1B-4C05

Freshwater
Mowilex 2B-4C1

Lilac Festival
Mowilex 4B-3C



Breath of Spring
Mowilex 7D-4A2

Rising Star
Mowilex 2C-4D1

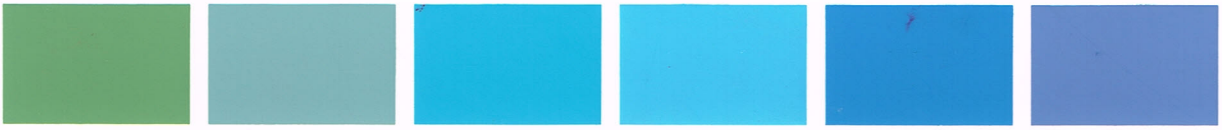
Baby Igloo
Mowilex 9C-5D1

Blue Suede Shoes
Mowilex 9C-3D2

Blue Navy
Mowilex 1B-5C1

Blue Crush
Mowilex 2B-5C15

Baby Violet
Mowilex 4B-4C



A New Leaf
Mowilex 7D-4A3

Wednesday Morning
Mowilex 5C-2D3

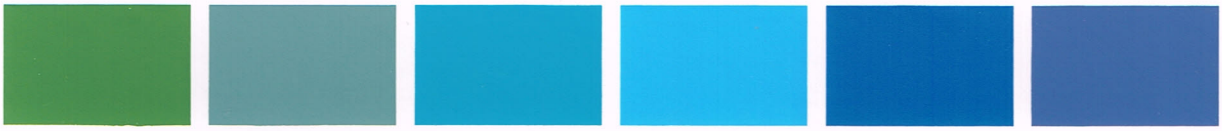
Blue Maldives
Mowilex 9C-55D15

Blue Patch
Mowilex C-5C1

Ocean Pacific
Mowilex 1B-6C2

Blue Moon
Mowilex 2B-4C3

Lavender Sky
Mowilex 4B-5C



After the Rain
Mowilex 7D-6A3

Lingering Secrets
Mowilex 5C-2D4

Blue Jazz Cafe
Mowilex 9C-55D2

Alone with You
Mowilex C-6C1

Sail Away
Mowilex 1B-6C3

Blue Hyacinth
Mowilex 2B-4C4

Violet Sequins
Mowilex 4B-3C



Verdant Green
Mowilex 9D-5A45

Roomful of Blues
Mowilex 5C-2D5

Out of the Blue
Mowilex 9C-3D4

Blue Azul
Mowilex C-6C3

Bali Blue
Mowilex 1B-6C35

Cape Horizons
Mowilex 2B-6C3

African Violet
Mowilex 4B-3C



Soft Water
Mowilex 1C-5D4

Breakwater Ridge
Mowilex 1C-1D6

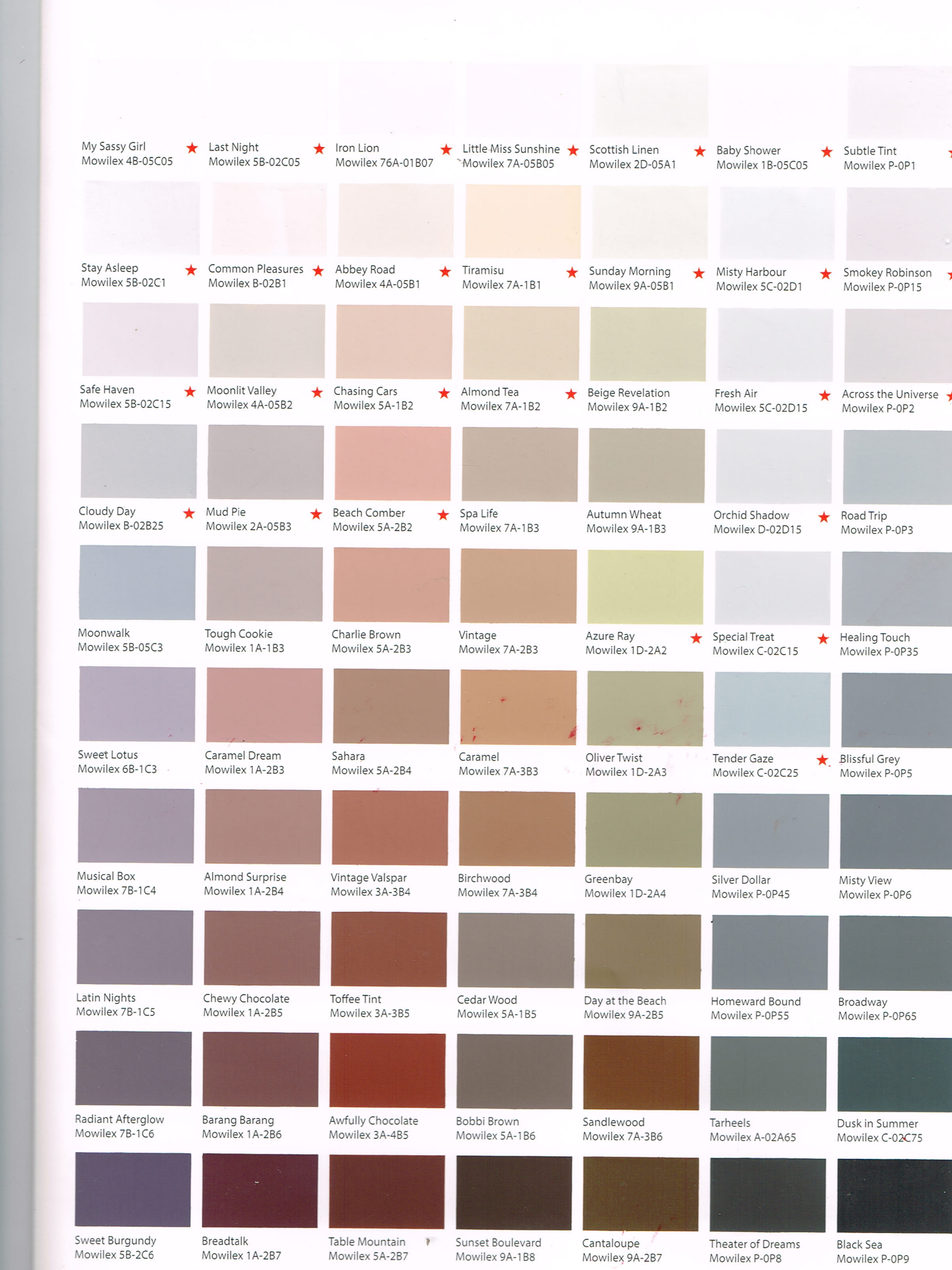
Arizona Blue
Mowilex 9C-3D6

Blue Haze
Mowilex C-5C4

Hard Rain
Mowilex 1B-4C5

Deep Blue Sea
Mowilex 2B-5C45

Venus Light
Mowilex 3B-3C



★ Tersedia untuk produk Vinyl Silk



WEATHERCOAT
Premium Exterior Paint

Warna tembok luar akan menciptakan persepsi tertentu dari suatu bangunan. Pengaplikasian cat dengan hasil akhir sentuhan warna yang senantiasa cemerlang dari waktu ke waktu akan menambah kesan positif bagi siapapun yang melihatnya. Mowilex Weathercoat mampu menciptakan bangunan berkesan premium dengan sentuhan hasil warna yang cemerlang dan tahan lama terhadap segala kondisi cuaca.

Mowilex Weathercoat merupakan cat tembok eksterior, tersedia dalam berbagai macam pilihan warna yang dibuat dengan menggunakan formulasi bahan khusus bermutu tinggi dan berbahan dasar 100% acrylic untuk memberikan perlindungan dan keindahan warna yang dapat bertahan lama.





EMULSION
Premium Interior Paint

Perpaduan warna - warni yang serasi dalam ruangan mampu menciptakan keindahan serta rasa nyaman bagi penghuni ruangan di dalamnya. Mowilex Emulsion merupakan solusi tepat bagi anda yang menginginkan hasil akhir dengan sentuhan warna - warni interior yang modern dan elegan.

Mowilex Emulsion merupakan cat tembok interior yang tersedia dalam berbagai macam pilihan warna, dibuat dengan menggunakan formulasi bahan - bahan khusus bermutu tinggi sehingga menutup dengan sempurna dan memberikan sentuhan warna - warni cemerlang untuk segala ruangan.







VINYL SILK

Silky Finish - Inter

Mowilex Vinyl Silk adalah cat tembok ber
dasar emulsi terpolymer dengan penamp
setengah kilap sehingga lapisan catnya li
juga halus.

Dengan sifatnya yang sangat keras dan ta
gosokan, Mowilex Vinyl Silk sangat sesua
diaplikasikan di area yang mudah kotor s
dapur, kamar mandi, atau area publik yan
dilalui, karena lapisannya sangat mudah
dibersihkan.





ACRYLIC GLOS ENAMEL

Premium High Glos

Mowilex Acrylic Gloss Enamel adalah cat
100% acrylic berbahan dasar air yang tah
dan memiliki keunggulan yang dapat me
permukaan kayu, metal, plesteran semen
dan gypsum di luar maupun di dalam.

UD. HARTONO
PATI



Mowilex Colour Design Center merupakan tempat penjualan produk Mowilex dimana warna - warna dapat dibuat dan diproduksi sesuai pilihan konsumen. Kami akan selalu berusaha untuk menciptakan dan memproduksi setiap warna yang diinginkan oleh konsumen yang datang dengan pilihan warnanya.

Mowilex Colour Design Center dioptimalkan untuk :
- Produk-produk berbahan dasar air.
- Sistem tinting yang modern untuk memastikan setiap warna yang dipilih dapat direplikasi berulang kali secara akurat dan konsisten.
- Memberikan formula warna dengan jangkauan yang luas sehingga menjamin tersedianya banyak pilihan warna serta.
- Colourant berkualitas tinggi mampu menghasilkan warna produk yang memuaskan.

Apabila anda sudah memiliki inspirasi pilihan warna, Mowilex Colour Design Center akan menciptakan Warna Pilihan Anda.

Kreasikan warna pilihan anda di toko-toko bertanda Mowilex Colour Design Center yang telah tersebar di seluruh Indonesia.

mowilex®
Inspiration for Life

PT. MOWILEX INDONESIA

Jakarta - Indonesia
Phone +62 21 540 666 3

www.mowilex.com

Mowilex Indonesia

@mow

DOWNLIGHT







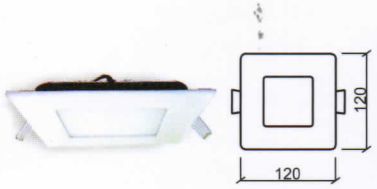
ARTOLITE

www.artolite.co.id

Taman Kebon Jeruk Blok AA VI No.1-3 Komplek INTERCON
Jl. Meruya Ilir, Jakarta 11620 - Indonesia
Ph : 62-21 586 4888 (Hunting), Fax : 62-21 585 9760 / 62

Jakarta Pusat, Jl. Gajah Mada No.3-5, Komp. Duta Merlin Blok C No.10 ; **Jakarta Pusat**, Jl. Salemba Raya, Pertokoan Kenari Baru Lt. II Blok C 15-20 ;
Jakarta Pusat, Jl. Salemba Raya, Gedung Kenari Mas Lt. LG A1/A2 ; **Jakarta Selatan**, JL. RS. Fatmawati No. 14C ; **Bekasi**, Jl. Inspeksi Kalimalang Raya No. 47/9 ;
Medan, Jl. Gatot Subroto No. 24 E ; **Pekanbaru**, Jl. Riau Ujung No. 83 A ; **Bandung**, Jl. Naripan No. 92 A;
Balikpapan, Pertokoan Haryono Palace No.27 JL. MT. Haryono ; **Semarang**, Jl. H. Agus Salim, Komp. Pertokoan Jurnatan Blok D No.9 ;
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DOWNLIGHT



ARRIGO

IP20 105

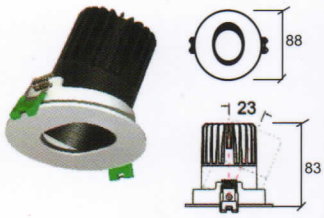
Lamp	Holder	Wattage
LED	-	6 W



FREZA

IP20 140

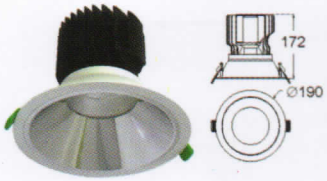
Lamp	Holder	Wattage
LED	-	15 W



NINO

IP20 75

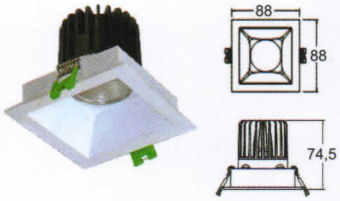
Lamp	Holder	Wattage
LED	-	9 W



ACQUEZ

IP20 170

Lamp	Holder	Wattage
LED	-	40, 50 W



ENZO SQ

IP20 75

Lamp	Holder	Wattage
LED	-	6, 9 W

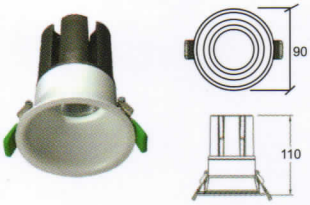


ENZO

IP20 75

Lamp	Holder	Wattage
LED	-	9 W

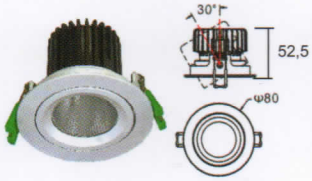
PT ABETAMA SEMPURNA



ALUCIO

IP20 80

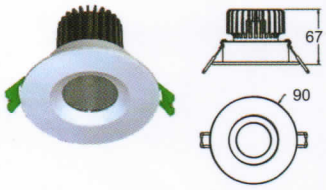
Lamp	Holder	Wattage
LED	-	9, 12, 15 W



QUARESMA

IP20 70

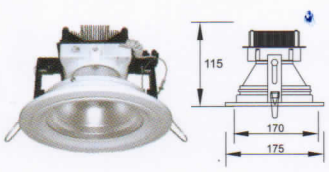
Lamp	Holder	Wattage
LED	-	6, 9, 15 W



NAVARO

IP20 65

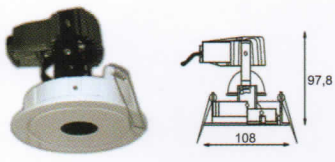
Lamp	Holder	Wattage
LED	-	9 W



THEME 150 LED STD

IP20 95

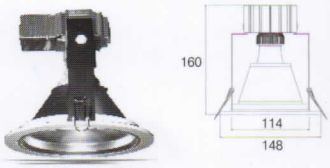
Lamp	Holder	Wattage
PREVALED CUBE	-	12 W
		25,3 W
		27,8 W



THEME VH RD

IP20 95

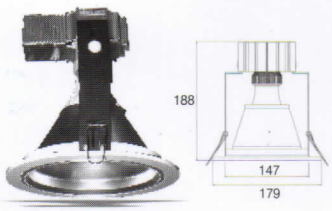
Lamp	Holder	Wattage
MR 16	GU5.3	35, 50 W
LED	GU5.3	4 - 7 W



THEME 125-60 E27 LED

IP20 132

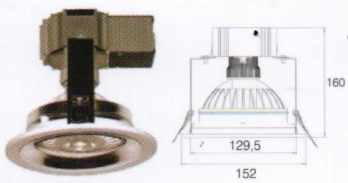
Lamp	Holder	Wattage
LED	E27	5, 7 W



THEME 150-70 E27 LED

IP20 150

Lamp	Holder	Wattage
LED	E27	5, 7 W

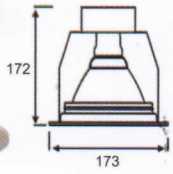


THEME 125 LED E27

IP20 132

Lamp	Holder	Wattage
LED PAR 30	E27	13 W



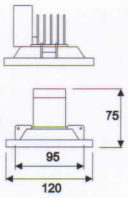


THEME 150 LED E27

IP20 (170)

Lamp	Holder	Wattage
LED PAR 38	E27	15, 18 W



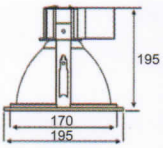


COMFORT 125 - 75 LED

IP20

Lamp	Holder	Wattage
DL-S	-	7 W
		1 2W



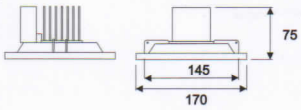


THEME VC RD

IP20 (175)

Lamp	Holder	Wattage
CDM-T	G12	35, 70, 150 W



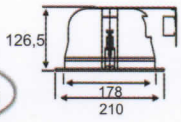


COMFORT 150 - 75 LED

IP20

Lamp	Holder	Wattage
DL-S	-	11.7 W
		15.2 W
		18.8 W
		24.1 W



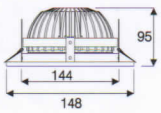


THEME 185 PLC

IP20

Lamp	Holder	Wattage
PL-C	G24d	2 x 13 W
		2 x 18 W
		2 x 26 W



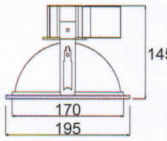


COMFORT 125 CN LED

IP20

Lamp	Wattage
PREVALED COIN 111 AC	1 5.5 W



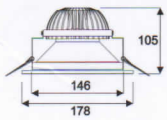


COMFORT VC RD

IP20 (175)

Lamp	Holder	Wattage
CDM-T	G 12	70, 1 50 W



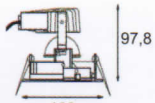


COMFORT 150 - 10 CN LED

IP20

Lamp	Wattage
PREVALED COIN 111 AC	22.5 W



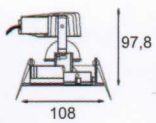


COMFORT VH RD

IP20 (95)

Lamp	Holder	Wattage
MR 16	GU5.3	35, 50 W
LED	GU5.3	4 - 7 W





COMFORT VHC RD

IP20 (95)

Lamp	Holder	Wattage
MR 16	GU5.3	35, 50 W
LED	GU5.3	4 - 7 W

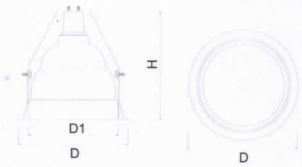
PT ABETAMA SEMPURNA



RD 175 E27

Lamp	Holder	Wattage
LED BULB	E27	13 W
LED PAR 38	E27	14.5 W

(180) IP20



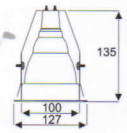
Dimensions (mm)

H	D1	D
185	170	200







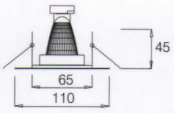


RD 100

IP20 (110)

Lamp	Holder	Wattage
ESSENTIAL	E27	8, 11,14, 18 W
LED	E27	5, 7, 8W

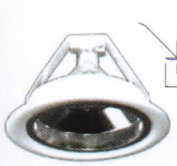


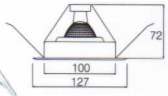


RWL 3 B

IP20 (80)

Lamp	Holder	Wattage
MR 16	GU 10	50 W
LED	GU 10	7 W



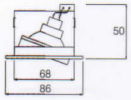


RD 100 HLG

IP20 (110)

Lamp	Holder	Wattage
MR 16	GU5.3	35, 50 W
LED	GU5.3	4 - 7 W



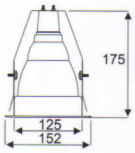


RWL 2-1 R HALOGEN

IP20 (87)

Lamp	Holder	Wattage
MR 16	GU5.3	35, 50 W
LED	GU5.3	4 - 7 W



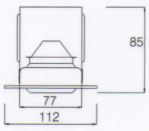


RD 125

IP20 (135)

Lamp	Holder	Wattage
ESSENTIAL	E27	8, 11,14, 18 W
LED	E27	5, 7, 8W



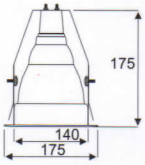


DO 3 HALOGEN

IP20 (87)

Lamp	Holder	Wattage
MR 16	GU5.3	35, 50 W
LED	GU5.3	4 - 7 W



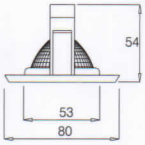


RD 150

IP20 (150)

Lamp	Holder	Wattage
ESSENTIAL	E27	8, 11,14, 18 W
LED	E27	5, 7, 8W



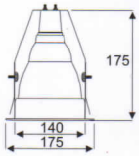


RD 2-1 HALOGEN

IP20 (63)

Lamp	Holder	Wattage
MR 16	GU5.3	35, 50 W
LED	GU5.3	4 - 7 W



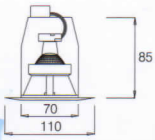


RD 150 W/ GLASS COVER

IP20 (150)

Lamp	Holder	Wattage
ESSENTIAL	E27	8, 11,14, 18 W
LED	E27	5, 7, 8W





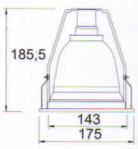
RD 3 HALOGEN REFF

IP20 (80)

Lamp	Holder	Wattage
MR 16	GU5.3	35, 50 W
LED	GU5.3	4 - 7 W

PLAZMA SERVISNA



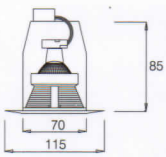


RD 150 GR3

IP20

Lamp	Holder	Wattage
PL-C	G24	13 - 18 W
ESSENTIAL	E27	8 - 18 W





RD 3 HALOGEN BAFFLE

IP20 (80)

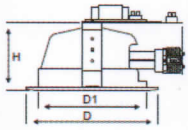
Lamp	Holder	Wattage
MR 16	GU5.3	35, 50 W
LED	GU5.3	4 - 7 W



RD HORIZONTAL PRS

IP20

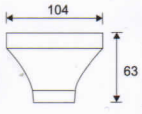
Lamp	Holder	Wattage
Essential	E27	8, 1 1 W
PL-C	2XG24d	10, 13, 18W



Dimensions (mm)

TYPE	D	D1	H
150	175	140	1 05
175	200	168	1 05



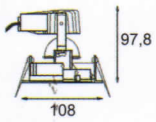


ROSET

Lamp	Holder	Wattage
Essential	E27	8, 11,14, 18 W
LED	E27	5, 7, 8 W

IP20



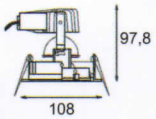


COZY VHA RD

IP20 95 30°

Lamp	Holder	Wattage
MR 16	GU5.3	35, 50 W
LED	GU5.3	4 - 7 W





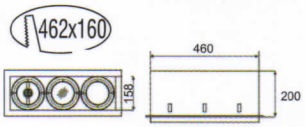
COZY VH RD

IP20 95 30°

Lamp	Holder	Wattage
MR 16	GU5.3	35, 50 W
LED	GU5.3	4 - 7 W

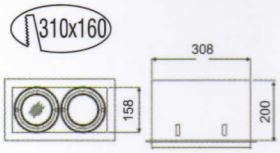


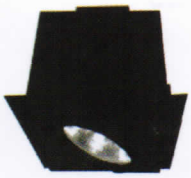
COZY SERIES 1



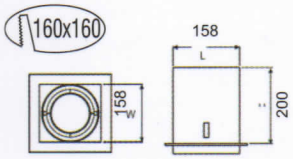


COZY SERIES 2



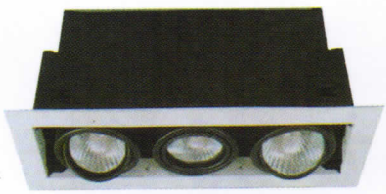


COZY SERIES 3

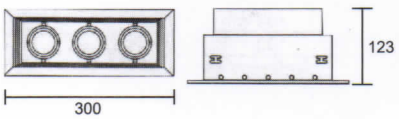


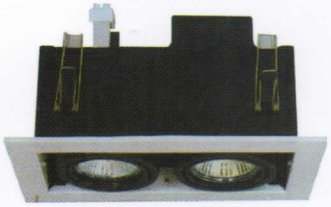
IP20

Lamp	Holder	Wattage
CDM-T	G12	70 - 1 50 W
CDM-R	E27	70 - 1 50 W
PAR 30	E27	70 - 1 50 W
AR 1 1 1	-	10, 15 W

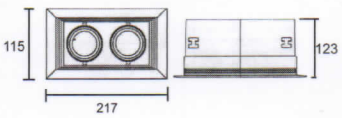


SPOTLIGHT MQ 202A 3L



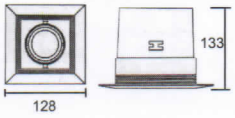


SPOTLIGHT MQ 202A 2L





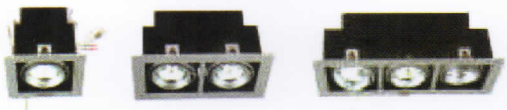
SPOTLIGHT MQ 202A 1L



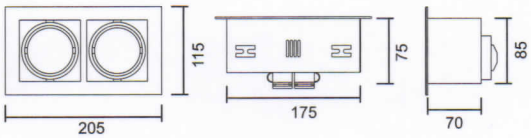
F IP20

Lamp	Holder	Wattage
MR 16	GU5.3	1x35W
		2x35W
		3x35W
LED	GU5.3	1x4W
		2x4W
		3x4W





COZY SDL 4002

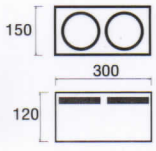


F IP20

Lamp	Holder	Wattage
LED	GU5.3	4 - 7W

PT ABETAMA SEMPURNA

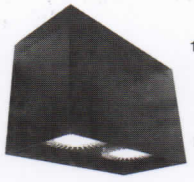


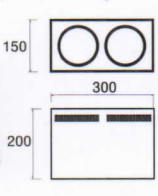


SM SQ 300-12

IP20

Lamp	Holder	Wattage
QR 1 1 1	-	2 x 35 W
		2 x 75 W
		2 x 100 W
LED	-	2 x 10 W
		2 x 15 W

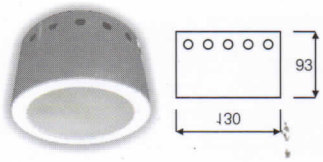




SM D SQ 300-20

IP20

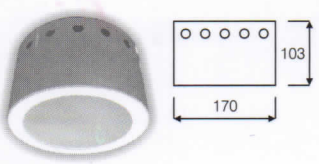
Lamp	Holder	Wattage
QR 1 1 1	-	2 x 35 W
		2 x 75 W
		2 x 100 W
LED	-	2 x 10 W
		2 x 15 W



SM D 125 - 85 LED

IP20

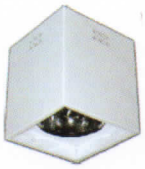
Lamp	Holder	Wattage
DL-S	-	6.8 W
		11.7 W



SM D 150 - 95 LED

IP20

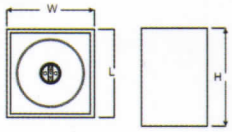
Lamp	Holder	Wattage
DL-S	-	11.7 W
		15.2 W
		18.8 W
		24.1 W



SM D CHOTAC

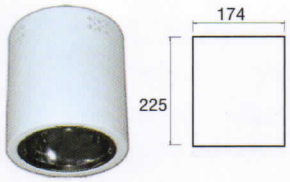
Lamp	Holder	Wattage
Essential	E27	8,14 W
LED	E27	5, 7, 8 W

IP20 SNI



Dimensions (mm)

TYPE	W	L	
100	134	134	200
150	175	175	200



SM D 150

IP20

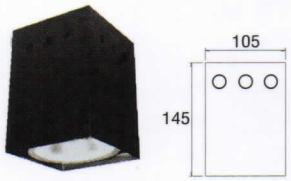
Lamp	Holder	Wattage
Essential	E27	14, 18 W
LED	E27	5, 7, 8 W



SM D 125 SQ E27

IP20

Lamp	Holder	Wattage
LED	E27	5, 7, 8 W



SM D 125-10 SQ E27

IP20

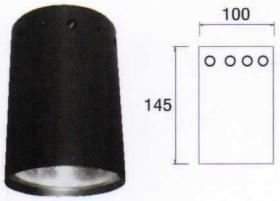
Lamp	Holder	Wattage
LED	E27	5, 7, 8 W



SM D 153 LED E27

IP20

Lamp	Holder	Wattage
LED	E27	10 W



SM D 114 LED E27

IP20

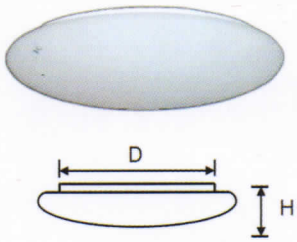
Lamp	Holder	Wattage
LED	E27	10 W



LUNAR 325 LED

IP20

Lamp	Wattage
CERTAFLUX DLM ES CL	14,8 W
	18,4 W



PLUTOS

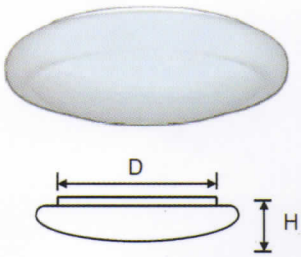
IP20

Lamp	Holder	Wattage
TL-C	G10	20 W
		32 W
CERTAFLUX DLM ES CL		14,8 W
		18,4 W
BASIC FLAT G1		23 W

Dimensions (mm)

TYPE	D	H
PLUTOS 20	237	76
PLUTOS 32	330	95

PT ABETAMA SEMPURNA



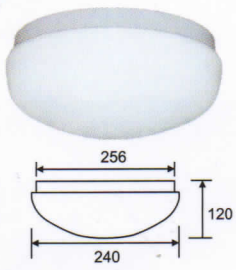
SANTOS

IP20

Lamp	Holder	Wattage
TL-C	G10	20 W
		32 W

Dimensions (mm)

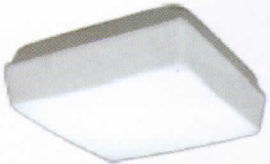
TYPE	D	H
SANTOS 20	237	90
SANTOS 32	330	100



SCCB ACR

IP20

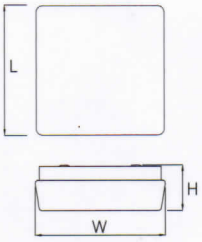
Lamp	Holder	Wattage
Essential	E27	8, 14, 18 W



SCB ACR

IP20

Lamp	Holder	Wattage
TL-C	G10	20 W
		32 W



Dimensions (mm)

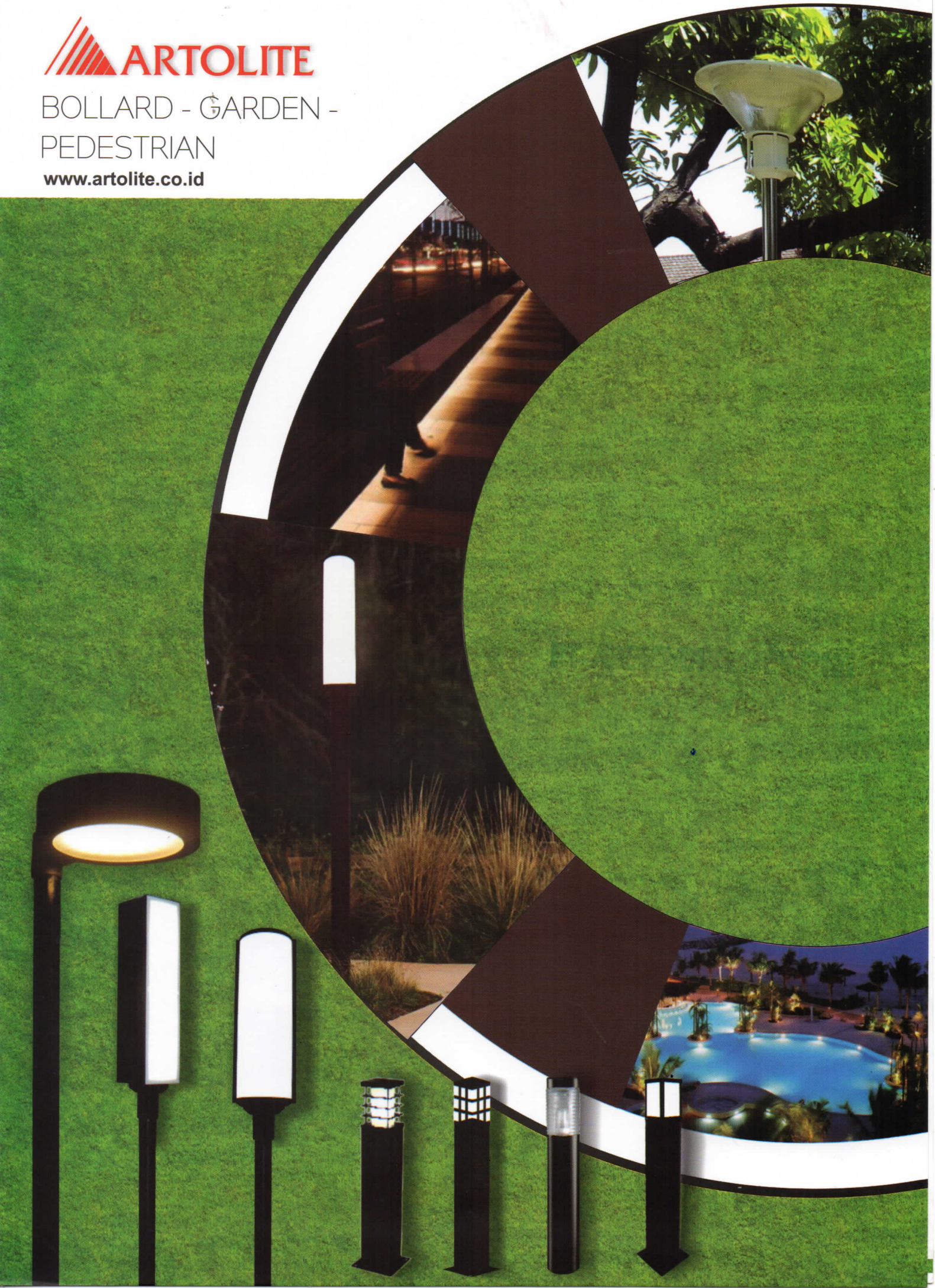
TYPE	L	W	H
SCB 20	240	240	95
SCB 32	330	330	100

Technical spesifications, product details and price are subject to change. Please check before ordering

ARTOLITE

BOLLARD - GARDEN -
PEDESTRIAN

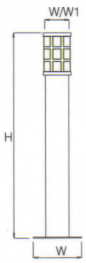
www.artolite.co.id



BOLLARD







GL SQ 130

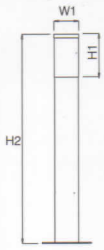
IP43

Lamp	Holder	Wattage
Essential	E27	11 - 14 - 18 W
LED	E27	5, 7, 8 W

Dimensions (mm)

W	W1	H
130	130	800





GL SQ 135

IP43

Lamp	Holder	Wattage
Essential	E27	11 - 14 - 18 W
LED	E27	5, 7, 8 W

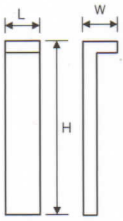
Dimensions (mm)

W	H1	H2
135	200	800



GL OPTICA 150 SQ

IP65



Lamp	Holder	Wattage
LED	-	5 W

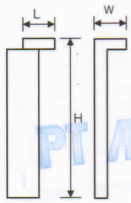
Dimensions (mm)

L	W	H
1 50	1 50	750



GL OPTICA SURYA 150 SQ

IP65



Lamp	Holder	Wattage
LED	-	5W

Dimensions (mm)

L	W	H
1 50	1 50	750

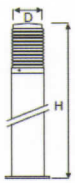
Battery : 6 Volt DC 4AH
Battery power : ± 12 Hours
Output Solar Cell : 14,4 Volt DC
Output to battery : 6,2 Volt DC/ Charge
Output to lamp : 3, 1 Volt DC

PT ARGHA SEMPURNA



GL PILAR DAICO

IP53



Lamp	Holder	Wattage
Essential	E27	18 - 23 W
LED	E27	5, 7, 8 W

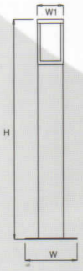
Dimensions (mm)

D	H
2 17	985
2 17	1030



GL PILAR DAIKO SQ 80 E27

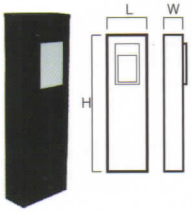
IP43



Lamp	Holder	Wattage
Essential	E27	8 -14,- 18 W
LED	E27	5-7-8 W

Dimensions (mm)

W	W1	H
120	135	975
120	135	1025



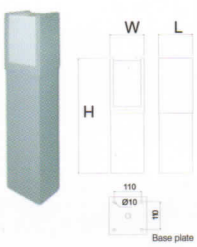
GL SQ 160 PL

IP43

Lamp	Holder	Wattage
Essential	E27	8 - 18 W
LED	E27	5, 7, 8W

Dimensions (mm)

L	W	H
160	80	600



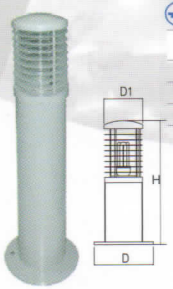
PL BD 137

IP43

Lamp	Holder	Wattage
Essential	E27	8 - 23 W
LED	E27	5, 7, 8W

Dimensions (mm)

L	W	H
150	150	500



PL BD 862

IP43

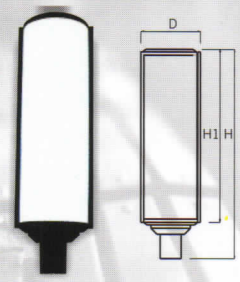
Lamp	Holder	Wattage
Essential	E27	18 - 23 W
PL -C	G24d	13 - 18W
LED	E27	5, 7, 8 W

Dimensions (mm)

D	D1	H
215	140	500
215	140	800

GARDEN LIGHT

GL SQ 134



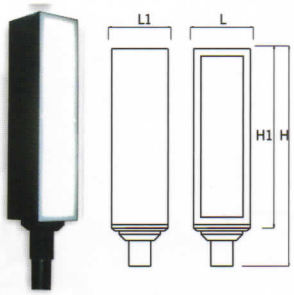
IP53

Lamp	Holder	Wattage
Certaflux Led Line	-	2 x 14 W
		4 x 14 W

Dimensions (mm)

D	D1	H
184	735	600

GL ZIGA SQ LED



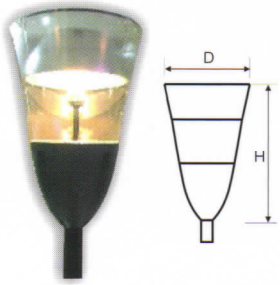
IP53

Lamp	Holder	Wattage
Certaflux Led Line	-	2 x 14 W

Dimensions (mm)

L	L1	H	H1
150	150	715	600

GL HERAS E27



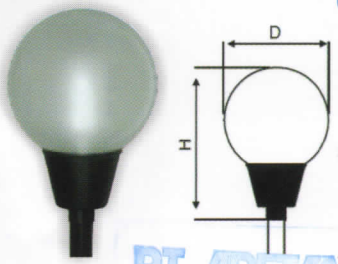
IP53

Lamp	Holder	Wattage
Essential	E27	18 - 23 W
Ecotone	E27	45 - 65 W

Dimensions (mm)

D	H
415	650

GL G



IP53

Lamp	Holder	Wattage
Essential	E27	18 - 64 W
LED	E27	5, 7, 8 W

Dimensions (mm)

D	H
305	430

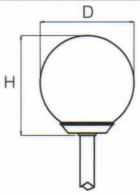
PT ABETAMA SEMPURNA

GL E27



IP53

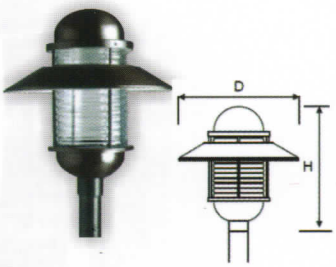
Lamp	Holder	Wattage
Essential	E27	18 - 64 W
LED	E27	5, 7, 8W



Dimensions (mm)

D	H
279	322
305	322

GL MINI CESSNA



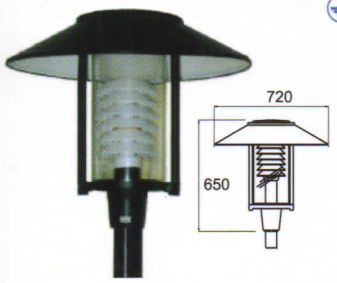
IP53

Lamp	Holder	Wattage
Essential	E27	8 - 23 W
LED	E27	5, 7, 8 W

Dimensions (mm)

D	H
347	365

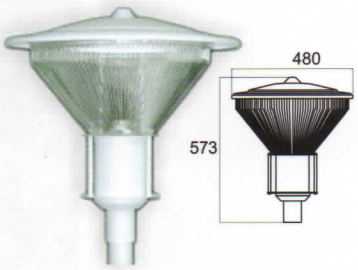
BIG CESSNA T



IP65

Lamp	Holder	Wattage
Essential	E27	35, 50, 70 W
CDM-T	G12	70 - 150 W
HPLN	E40	125 W

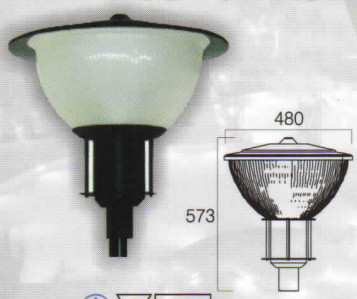
GL TOP TRP T



IP65

Lamp	Holder	Wattage
Essential	E27	35, 50, 70 W
CDM-T	G12	70 - 150 W
HPLN	E40	125 W

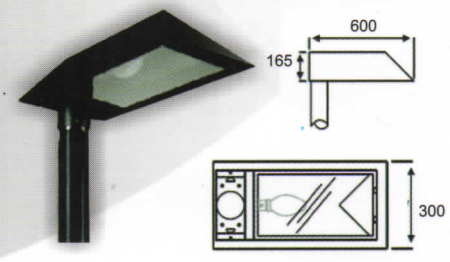
GL TOP ACR T



IP54

Lamp	Holder	Wattage
Essential	E27	35, 50, 70 W
CDM-T	G12	70 - 150 W
HPL-N	E40	125 W

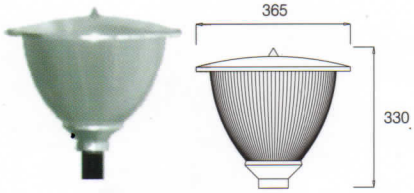
SL HELIO



IP53

Lamp	Holder	Wattage
HPL-N	E27	50 - 125 W
SON-T	E27	70 W

GL CEDE GRILL



IP53

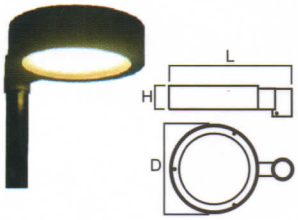
Lamp	Holder	Wattage
ESSENTIAL	E27	8, 14, 18, 23 W
LED	E27	5, 7, 8 W





SPOTLIGHT

PL AJB 325



IP66

Lamp	Holder	Wattage
LED	-	20.5 W

Dimensions (mm)

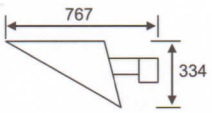
D	L	H
325	442	85

SL PRISMA

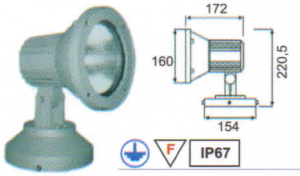


IP53

Lamp	Holder	Wattage
HPL-N	E27	50 - 125 W
SON-T	E27	70 W



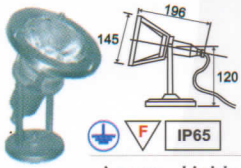
SPOT APL III G12



IP67

Lamp	Holder	Wattage
CDM-T	G12	35 - 70 W

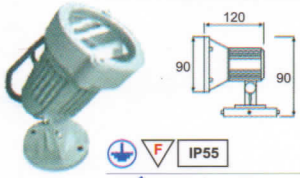
SPOT GL 20212



IP65

Lamp	Holder	Wattage
PAR 38	E27	80 W

SPOT MARESCA



IP55

Lamp	Holder	Wattage
MR 16	GU5.3	35, 50 W
LED	GU5.3	4 - 7 W

PT ABETAMA SEMPURNA

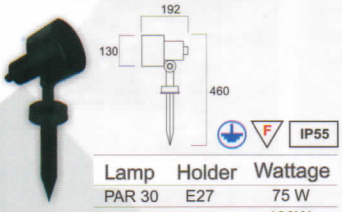
SPOT GL 20782



IP65

Lamp	Holder	Wattage
PAR 30	E27	75 W
		100W

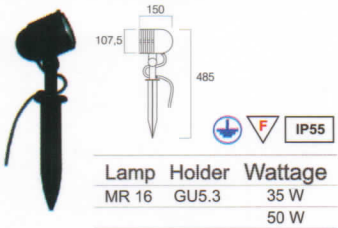
SPOT GL 2085



IP55

Lamp	Holder	Wattage
PAR 30	E27	75 W
		100W

SPOT GL 2087



IP55

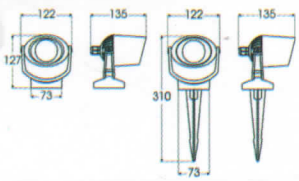
Lamp	Holder	Wattage
MR 16	GU5.3	35 W
		50 W



SPOT ARMY

IP66

Lamp	Holder	Wattage
Halogen	Gu10	35 W
LED	Gu10	4.5 W



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Technical spesifications, product details and price are subject to change. Please check before ordering

DECORATIVE LAMP

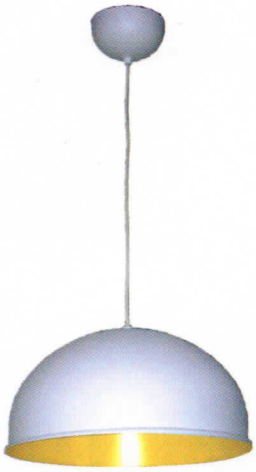


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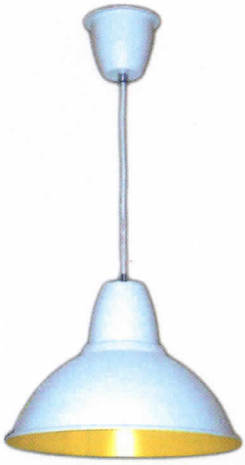
HL LUNAR 325 B LED



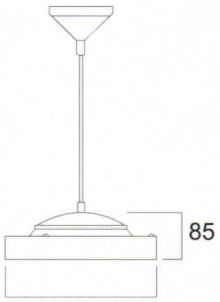
HL ASTO

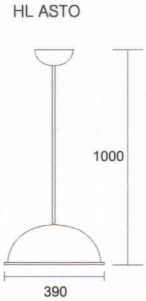


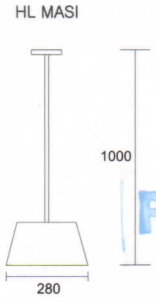
HL MASI

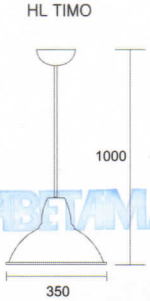


HL TIMO









HL TIMO, HL MASI, HL ASTO IP20

Lamp	Holder	Wattage
LED	E27	4, 7, 9 W
Essential	E27	11, 14 W

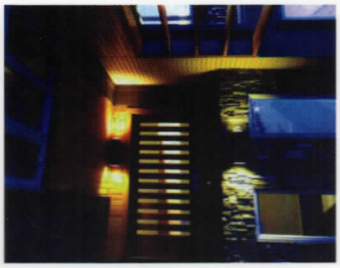
HL LUNAR 325 B LED IP20

Lamp	Holder	Wattage
LED		14.8W

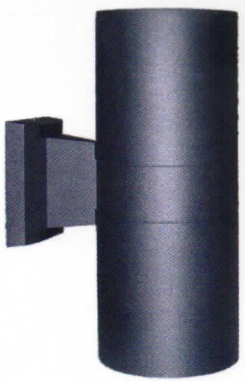
PT ABETAMA SEMPURNA











TUBA UP DOWN 108



TUBA UP DOWN 118

Lamp	Holder	Wattage
Essential	E27	11, 14 W
PAR 20	E27	50 W
PAR 30	E27	75, 100 W

IP65



TUBA UP 108



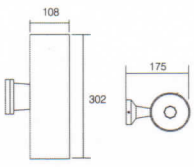
TUBA DOWN 108



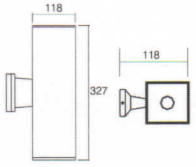
TUBA UP 118



TUBA DOWN 118



TUBA UP DOWN 108



TUBA UP DOWN 118



HL VANY E27



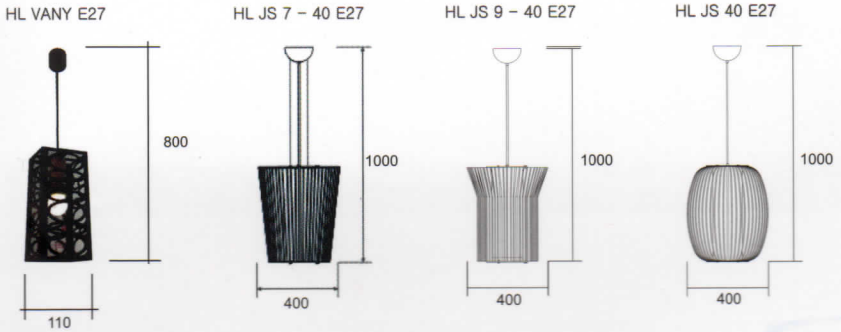
HL JS 7 - 40 E27



HL JS 9 - 40 E27



HL JS 40 E27



Lamp	Holder	Wattage
LED	E27	4, 7, 9 W

IP20

PT ABET[illegible]URNA



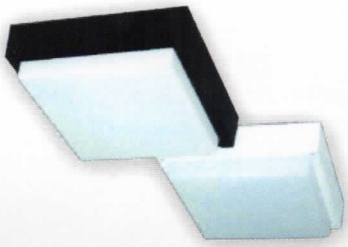
XEON BOWL A IP54



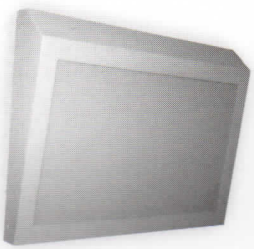
XEON BOWL B IP54



XEON BOWL C IP54



XEON SQUARE 270 IP65



WL PARKING LED IP54

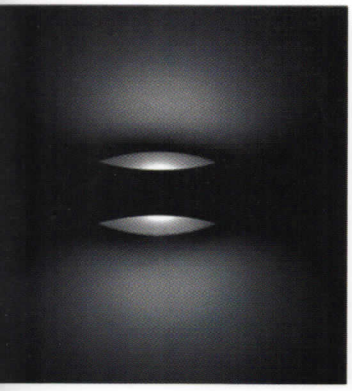
Type	Lamp	Wattage
XEON BOWL A	PL-C	10, 13 W
XEON BOWL B	PL-C	10, 13 W
XEON BOWL C	PL-C	10, 13 W
XEON BOWL 270	PL-C	10, 13 W
WL PARKING LED	PL-C	18 W

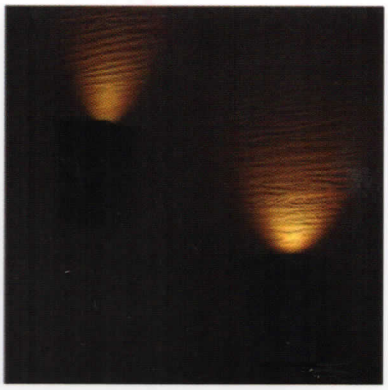
XEON BOWL

Body : Die-Cast Aluminium
Finishing : Powder Coating
Cover : Frosted Glass

WL PARKING LED

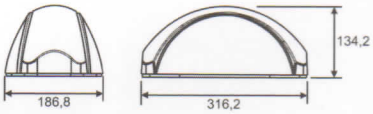
Body : Steel Plate
Finishing : Powder Coating
Cover : Acrilic





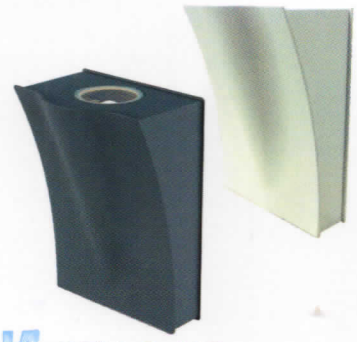


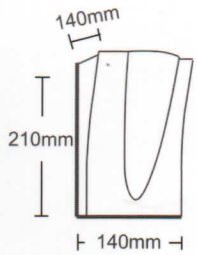

WL CELI G-190



Wattage : HQI 150W
Body : Die Cast Aluminium

IP54





Wattage : 3W LED COB
Body : Die Cast Aluminium

IP54

PT ABETAMA SEMPURNA

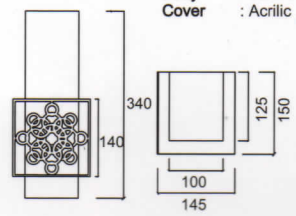
WL CELI G-168



WL CHOCHO ACR E27

IP20

Wattage : LED BULB 4W, 7W, 9W
Body : Steel Plate
Cover : Acrilic

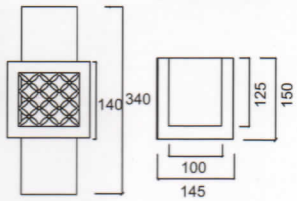




WL HADE ACR 2 x E27

IP20

Wattage : LED BULB 4W, 7W, 9W
Body : Steel Plate
Cover : Acrilic

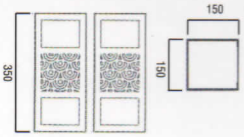




WL LOMO 2xE27

IP20

Wattage : GENIE 5W, 8W
Body : Steel Plate
Cover : Acrilic

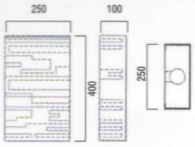


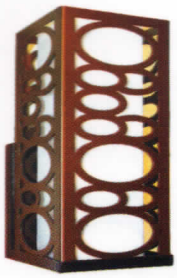


WL BALCONY 2xE27

IP20

Wattage : GENIE 5W, 8W
Body : Steel Plate
Cover : Acrilic

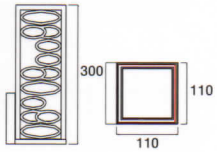


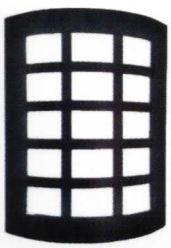


WL VANY E27

IP20

Wattage : GENIE 5W, 8W
Body : Steel Plate
Cover : Acrilic

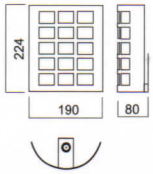




WL 190 STL E27

IP20

Wattage : GENIE 5W, 8W
4W, 7W, 9W
Body : Stainless Steel
Cover : Acrilic 2mm

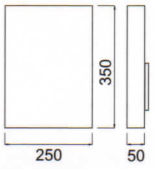


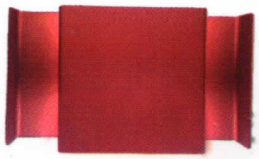


WL HD 350 2xPL

IP20

Wattage : PL-C 7W
Body : Steel Plate
Cover : Acrilic

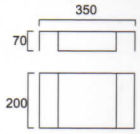




WL ALUZE LED

IP20

Wattage : LED PCB 10W
Body : Steel Plate
Reflector : Anodised Sanblasting

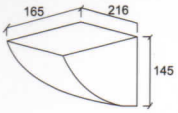




WL UP SEGA

IP20

Wattage : LED BULB 9,5W
Body : Steel Plate
Finishing : Powder Coating

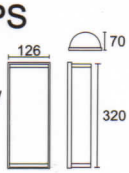




WL ELLIPS

IP20

Wattage : Essential 11-14 W
led 4W, 7W, 9W
Body : Stainless Steel
Cover : Acrilic

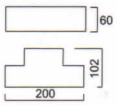


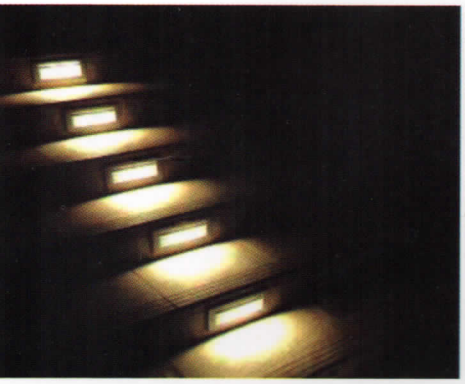


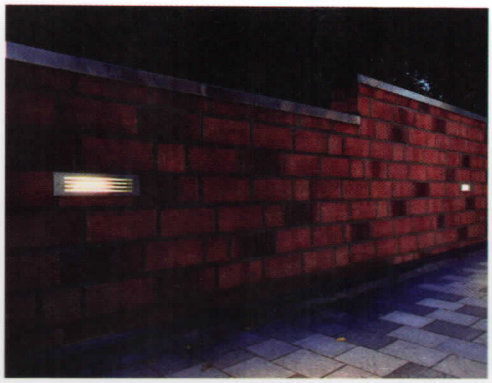
WL F 200

IP20

Wattage : GENIE 5-8W
Body : Steel Plate
Cover : Acrilic

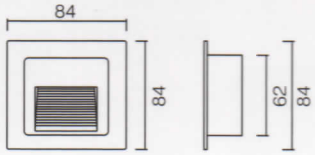










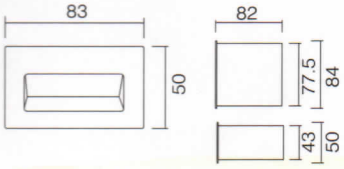


XEON SL 1102

IP54

Wattage : LED 1W
CCT : 3000K
Body : Die Cast Aluminium





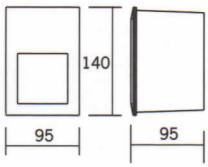
XEON FL W002

IP54

Wattage : LED 1.5W
Body : Die Cast Aluminium

PT ABETAMA SEMPURNA



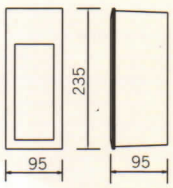


XEON STRIPE

IP54

Wattage : LED 5W
Body : Aluminium



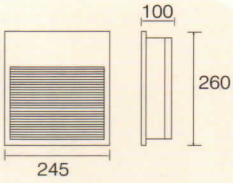


XEON SLIM

IP54

Wattage : LED 5W
Body : Aluminium





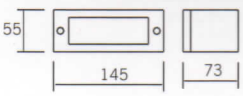
XEON RECTA

IP54

Wattage : LED 5W
PL-C 13W
Body : Aluminium





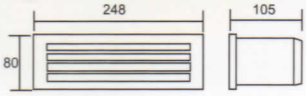


XEON FLAT

IP54

Wattage : LED 5W
Body : Aluminium

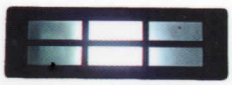


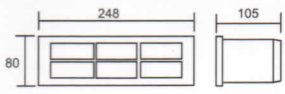


XEON ST80

IP54

Wattage : PL-C 10-13W
Body : Aluminium



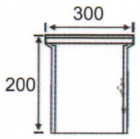


XEON SQ 80

IP54

Wattage : PL-C 10-13W
Body : Aluminium



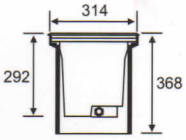


IL SHARP S

IP68

Lamp	Holder	Wattage
CDM-T	G12	35, 70, 1 50 W



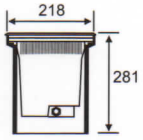


SHARP I

IP67

Lamp	Holder	Wattage
CDM - T	G12	70, 150 W
CDM - TD	Rx7s	70, 150 W





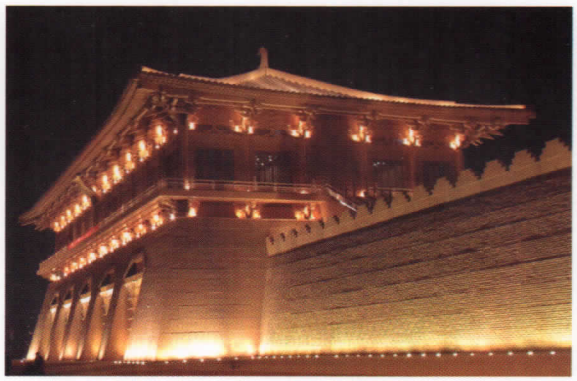
SHARP III

IP67

Lamp	Holder	Wattage
CDM - T	G12	35, 70, W

PT ABETAMA SEMPURNA

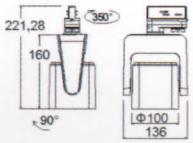




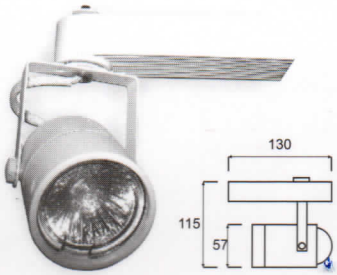




DELUZE



Wattage	: LED 30W ± 10% LED 33W ± 10%
Housing	: Aluminium
Optics	: 15°, 20°, 24°, 40°, 60°
CRI	: > 80
CCT	: 2700K, 3000 K, 4000K, 5000K
Lifetime	: 50.000 hrs



SPOT RIO LED

IP65

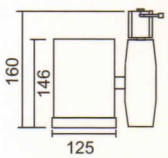
Wattage	: LED MR16 7W
Housing	: Die Cast Aluminium
Finishing	: Powder Coating
Optics	: 15°, 24°, 36°, 60°
CRI	: > 80
CCT	: 2700 K, 3000 K, 4000K
Lifetime	: 40.000 hrs



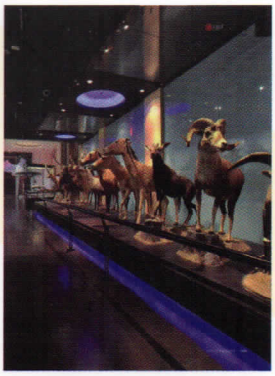
SILINDRA ART DCT

IP20

Wattage	: LED COIN 111 22,5W LED COIN 111 33,8W
Housing	: Die Cast Aluminium
Optics	: 24°, 40°
Finishing	: Powder Coating
CRI	: > 80
CCT	: 3000 K, 4000K
Lifetime	: 50.000 hrs







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Savy

DOWNLIGHT
OFFICE LIGHT
GARDEN LIGHT
STREET LIGHT
HANGING LIGHT
STANDING LIGHT
WALL LIGHT
INDUSTRIAL LIGHT

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HOME LIGHTING DESIGN



Façade [Fasade]

Pengertian Fasade adalah tampilan muka bangunan dari keseluruhan bentuk bangunan. Pencahayaan pada fasade bangunan diperlukan untuk menampilkan bentuk dan detail arsitektural sebuah bangunan. Pencahayaan fasade umumnya menggunakan tipe lampu sorot dengan sudut yang besar (*floodlight*), dimana dengan lampu tipe tersebut dapat menerangi area fasade yang ingin ditonjolkan. Penerangan dapat juga dilakukan dengan menggunakan lampu jenis *spotlight* (lampu sorot dengan sudut pencahayaan yang lebih kecil)*; striplight* (lampu yang dapat menunjukkan outline bangunan)*;* atau jenis *uplight* (lampu yang mengarah ke atas).

Teknik pencahayaan yang digunakan dapat beragam, untuk menampilkan kesan megah, bidang-bidang vertikal yang ada pada fasade bangunan dapat diberi sorot lampu, sehingga memberi penegasan pada bidang-bidang vertikal fasade. apabila ingin menampilkan ciri khas bangunan, detail-detail yang ada pada fasade bangunan yang dipertegas. Misal pada bangunan bergaya klasik, dimana terdapat banyak detail pada fasadenya.

Jika ingin menampilkan bentuk bangunannya dapat menggunakan lampu jenis *striplight*, dimana dengan tipe lampu jenis ini outline dari bangunan dapat dipertegas, sedangkan untuk menampilkan effect siluet pada bangunan dapat dilakukan dengan memberikan pencahayaan dari arah belakang bangunan.

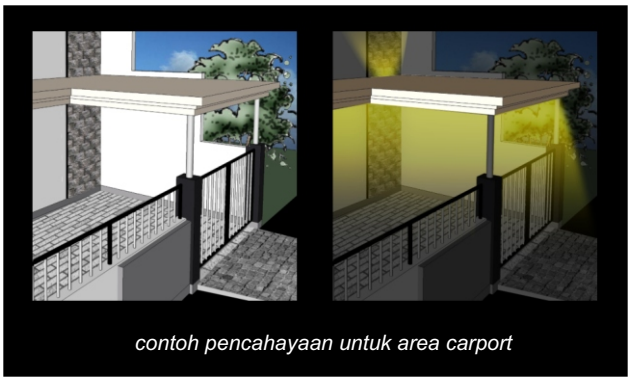
Penerangan pada fasade dapat menggunakan lampu sorot dengan tipe reflektor *asymmetric*. Karena dengan sudut reflektor *asymmetric*, area fasade bangunan dapat diterangi secara optimal. Jika ingin menerangi bidang-bidang yang umum dapat menggunakan lampu sorot dengan dengan tipe reflektor *symmetric*.



contoh pencahayaan fasade

Garage / Carport

Garasi dan Carport memiliki fungsi yang sama namun berbeda karakter dan tempat, jika Garasi merupakan bagian dari ruang dalam, sedangkan carport merupakan bagian dari ruang luar (karena berada di luar ruangan/ bangunan).



contoh pencahayaan untuk area carport

Pencahayaan pada kedua area tersebut memiliki fungsi yang sama, yaitu sebagai penerangan umum dimana lebih diutamakan untuk keamanan. Area garasi seringkali digunakan sebagai tempat untuk reparasi/ service, sehingga perlu pencahayaan yang cukup terang untuk menerangi kegiatan di tempat tersebut.

Pada area carport, pencahayaan lebih kepada *accent lighting* karena penerangan di area carport ikut mempengaruhi penerangan pada fasade bangunan (karena carport berada pada bagian tampak bangunan). Jenis lampu yangdapat digunakan pada area carport seperti lampu dinding, lampu jenis *batten* (dengan cover, untuk memberikan proteksi terhadap lampu), ataupun tipe lampu sorot untuk memberi effect *washing* pada kanopi carport.

Penggunaan lampu sorort pada area carpot, aplikasinya dapat dilakukan dengan menyorot bidang atap (memberikan ketegasan material yang digunakan) sehingga menimbulkan *indirect effect* pada permukaan carport. Untuk lampu dinding, dapat menggunakan tipe lampu dinding yang memberikan efek *washing* pada dinding sekitar carport, dapat juga lampu dinding tersebut ditempatkan pada kolom-kolom penyangga kanopi. Atau dengan cara yang sederhana, dapat menggunakan lampu tipe *batten* untuk penerangan carport, dengan meletakkannya pada kanopi carport.



Garden [Taman]

Taman merupakan suatu area dimana pemilik rumah ingin merasakan kesejukan yang dihadirkan olehnya, dalam hal ini taman berfungsi sebagai *relaxing and therapy zone* bagi pemilik rumah, terutama di waktu-waktu santai pemilik rumah, yaitu saat pagi hari dan menjelang sore. Ketika malam hari fungsi taman sedikit berubah, menjadi *therapy and romantic zone*, dalam suasana ini pemilik rumah menikmati keindahan taman sebagai perenungan dan penyegaran diri. Melalui pemanfaatan pencahayaan yang baik, fungsi taman sebagai tempat penyegaran diri di malam hari dapat tercapai. Penggunaan warna-warna cahaya yang lembut memberikan kesan suasana akrab, ramah, dan tenang di sekitar taman.



contoh pencahayaan pada area taman

Ada baiknya penggunaan lampu taman disesuaikan dengan gaya/ konsep taman yang ada, karena jika tidak, penggunaan lampu taman justru dapat merusak konsep taman tersebut. Tempatkan beberapa lampu sorot untuk menyorot tanaman agar memberikan kesan dramatis, lampu jenis halogen sangat sesuai untuk menyinari tanaman, karena lampu jenis halogen memiliki renderasi warna hijau dan warna kuning yang baik (unsur warna yang umumnya terdapat pada tanaman).

Jika terdapat kolam ikan pada taman, letakkan lampu kolam untuk memberikan pencahayaan di dalam air, gerak-geliat ikan di kolam akan sangat indah ketika melewati cahaya sinar yang seolah-olah 'membanjiri' kolam.

Terrace [Teras]

Dalam pengertian tertentu dapat disebut juga *verandah/* beranda (ruang terbuka yang terdiri dari atap dan lantai di sepanjang salah satu sisi rumah - *oxford dictionary*).

Teras merupakan ruang transisi antara ruang luar dengan ruang dalam, aktifitas yang terjadi di ruang ini juga tidak terlalu intensif, namun dari ruang inilah suasana santai dapat dinikmati oleh pemilik rumah. Letak teras juga berbeda-beda, ada Teras Depan; Teras Samping; ataupun Teras Belakang, tergantung dari jenis kegiatan yang terjadi, apakah *privat; semi-privat; atau umum*. Di bagian depan, teras merupakan ruang untuk kegiatan umum maupun kegiatan yang bersifat *semi-privat*, karena pada area ini, teras berfungsi sebagai ruang penerima tamu. Teras yang bersifat *privat* adalah teras samping dan teras belakang, karena pada bagian ini, teras digunakan oleh pemilik rumah sebagai tempat untuk bersantai dan menikmati saat-saat istirahat.

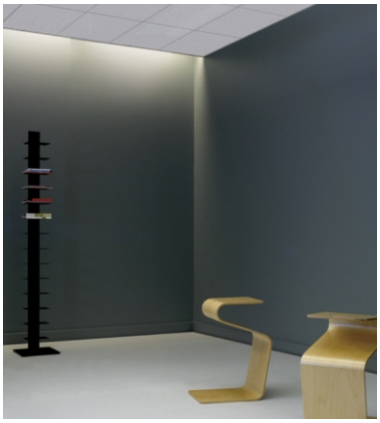
Pencahayaan ruang teras ini dapat menggunakan beberapa jenis lampu dekoratif (tergantung konsep ruang yang diinginkan), misal :ruang teras ber-konsep minimalis dapat menggunakan lampu gantung dengan bentuk yang minimalis dengan penempatan downlight pada plafond teras, sehingga tetap dapat memberikan penerangan yang cukup pada area tersebut.

Penambahan lampu dinding pada sisi-sisi teras untuk accent lighting dapat mem-berikan nuansa yang berbeda, lampu tipe *standing lamp* dapat juga ditempatkan pada ruang teras jika pemilik rumah sering menggunakan teras sebagai tempat untuk membaca ataupun berdiskusi antar anggota keluarga.

Jika teras digunakan hanya sebagai ruang antara (bukan untuk ruang duduk), penggunaan *accent lighting* cukup untuk menerangi aktifitas yang terjadi, jika teras yang digunakan sebagai area penerima tamu dan ruang duduk bersama, ada baiknya penerangan area tersebut menggunakan pencahayaan yang merata, hal ini dimaksudkan untuk menunjang aktivitas yang terjadi di ruang tersebut.



contoh penerangan teras



contoh penerangan foyer

Foyer

Foyer merupakan area transisi atau juga berfungsi sebagai area 'penerima' (sebelum masuk ke ruang utama). Pencahayaan yang digunakan pada area ini umumnya menggunakan pencahayaan *general* dengan paduan *accent lighting* - untuk memberikan kesan akrab, karena fungsi foyer sebagai ruang perantara menuju ke ruang utama. Aplikasi pencahayaannya dapat menggunakan lampu downlight, dengan tingkat pencahayaan yang cukup (tergantung kesan ruang yang akan ditampilkan; kesan resmi, santai atau akrab), pencahayaan dapat juga dikombinasikan dengan *indirect light*, maupun uplight untuk membuat ruangan lebih ekspresif, dan menunjukkan karakter material yang digunakan pada ruangan.

Guest room [Ruang Tamu]

Ruang tamu, merupakan area utama yang akan dirasakan oleh para pendatang (tamu), untuk itu pencahayaan ruang tamu harus dapat memberikan kesan/ nuansa yang welcome.

Jenis lampu yang digunakan dapat berupa jenis downlight, maupun jenis lampu decorative. penegasan pada obyek-obyek yang artistik baik lukisan, patung, maupun dinding bertekstur sangat disarankan, sehingga nuansa arsitektural yang diciptakan oleh perancang dapat lebih mendukung kesan ruang. Aplikasi yang digunakan merupakan jenis *accent lighitng*, dimana efek cahaya yang digunakan merupakan cahaya aksen, seperti halnya efek *wallwasher* pada area dinding, efek *shadow* pada patung, efek *dot* pada satu obyek tertentu, maupun efek-efek lainnya yang turut mendukung suasana ruang tamu.



contoh penerangan ruang keluarga

Living Room [Ruang Keluarga]

Ruang Keluarga merupakan area atau ruang yang lebih private dibandingkan dengan ruang tamu, karena pada area ini hanya kenalan atau teman dekat dari pemilik rumah yang biasanya boleh diijinkan untuk masuk ke dalam ruangan ini.

Pencahayaan yang dapat digunakan di ruangan ini adalah jenis general lighting, karena ruang keluarga tidak hanya sebagai tempat untuk berkumpulnya para penghuni rumah, melainkan juga sebagai tempat untuk nonton bersama (ruang keluarga cenderung dengan area nonton, karena hampir setiap ruang keluarga pasti terdapat pesawat televisi), untuk itu pencahayaan yang cukup dan merata sangat diperlukan, bahkan ruang keluarga juga digunakan untuk ruang belajar bersama. Penempatan lampu-lampu hias berupa lampu gantung maupun lampu dinding perlu diperhatikan, agar dapat lebih menunjang baik dari segi estetika maupun kebutuhan pencahayaannya.



contoh penerangan ruang tamu



contoh penerangan ruang tidur

Bedroom [Kamar Tidur]

Tempat tidur merupakan area pribadi, sebuah tempat yang memerlukan suasana relaksasi bagi orang yang tinggal di dalamnya. Pencahayaan di tempat tidur dibuat secara minim untuk menciptakan suasana yang nyaman dan tenang, sehingga fungsi ruang tidur sebagai "tempat istirahat" dapat dinikmati oleh orang yang ada di dalamnya. Penggunaan warna yang berjenis warm (hangat) sangat disarankan, karena cahaya yang berwarna hangat dapat juga menciptakan suasana yang nyaman, terlebih lagi jika cahaya tersebut dapat diatur intensitasnya yaitu dengan menggunakan sistem *dimmer* (alat untuk mengontrol kuat-lemah terang cahaya).

Dining Room [Ruang Makan]

Pencahayaaan untuk area makan, ada baiknya lebih dikonsentrasikan pada area meja makan, agar orang dapat lebih menikmati makanannya dan lebih jelas saat melihat hidangan yang disajikan. Aplikasi pencahayaannya dapat dengan general lighting, yaitu dengan menggunakan lampu-lampu tipe downlight disekitar meja makan. Untuk lebih menerangi area meja, dapat juga ditempatkan lampu gantung yang ketinggiannya dapat disesuaikan (*adjust*) sesuai dengan keinginan kita. namun, anda juga dapat menerapkan konsep lain, yaitu dengan menggunakan lampu indirect pada langit-langit ruang makan, kemudian gunakan lampu gantung dengan jenis cover yang cahayanya selain kebawah juga berpendar (secara *diffuse*) ke atas.



Contoh penerangan meja makan

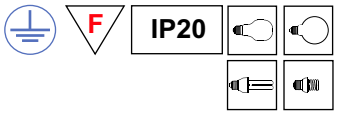


contoh penerangan area dapur

Kitchen [Dapur]

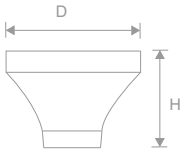
Dapur memerlukan tingkat pencahayaan yang sangat tepat, karena berbagai kegiatan yang detail dilakukan di sini (meracik bumbu, mengiris, memotong, dll). penerangan yang perlu diperhatikan terutama terletak pada sekeliling meja saji, hal tersebut diterapkan agar penghuni merasa aman dan nyaman saat sedang melakukan pekerjaan memasak. jika terdapat over head cabinet, ada baiknya anda meletakkan *strip lghting* dibawah cabinet tersebut, selain menambah tingkat penerangan, fungsi *strip lighting* juga dapat menambah estetik *accent lighting* pada area dapur.





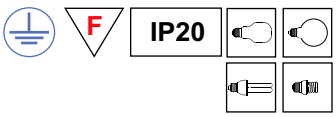
ROSET

Name	Lamp	Lamp Holder	W
ROSET	Incandescent	E27	15
	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent Globe	E27	60
	Incandescent Globe	E27	100
	Essential	E27	8
	Essential	E27	14
	Essential	E27	18
	Genie	E27	8
	Genie	E27	11
	Genie	E27	14



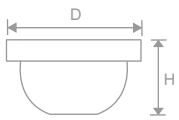
DIMENSION (mm)	
D	H
104	63





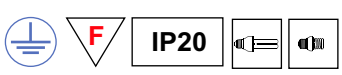
ROSET

Name	Lamp	Lamp Holder	W
ROSET PC	Incandescent	E27	15
	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent Globe	E27	60
	Incandescent Globe	E27	100
	Essential	E27	8
	Essential	E27	14
	Essential	E27	18
	Genie	E27	8
	Genie	E27	11
	Genie	E27	14



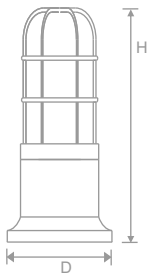
DIMENSION (mm)	
D	H
110	70





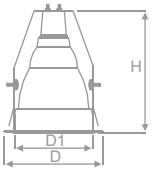
ROSTER

Name	Lamp	Lamp Holder	W
ROSTER	Essential	E27	8
	Essential	E27	14
	Essential	E27	18
	Genie	E27	8
	Genie	E27	11
	Genie	E27	14



DIMENSION (mm)	
D	H
100	210

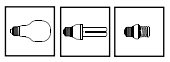
RD 100



DIMENSION (mm)		
D	D1	H
127	100	135

Name	Lamp	Lamp Holder	W
RD 100 E27	Incandescent	E27	15
	Incandescent	E27	25
	Incandescent	E27	40
	Essential	E27	8
	Genie	E27	11
	Genie	E27	14

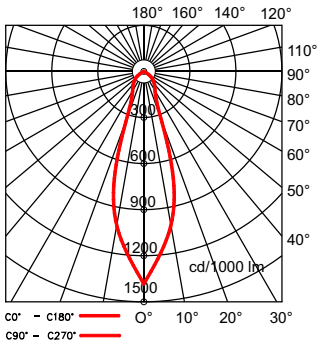


F IP20 

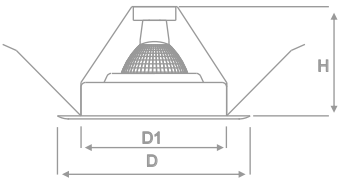


RD 100 HLG

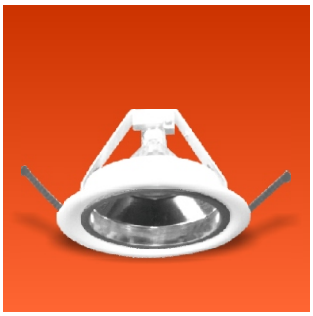
Light Distribution Curve (Cd/1000Lm)

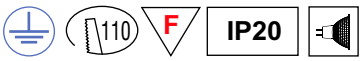


DIMENSION (mm)		
D	D1	H
127	100	72



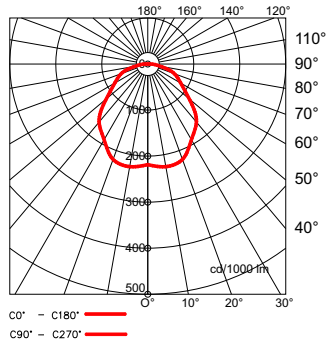
Name	Lamp	Lamp Holder	W
RD 100 HLG	QR-CBC51	GU5.3	20
	QR-CBC51	GU5.3	35
	QR-CBC51	GU5.3	50



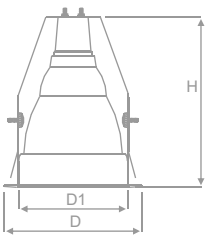


RD 125

Light Distribution Curve (Cd/1000Lm)

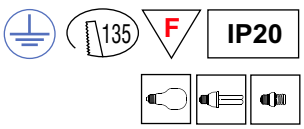


DIMENSION (mm)		
D	D1	H
152	125	175



Name	Lamp	Lamp Holder	W
RD 125 E27	Incandescent	E27	15
	Incandescent	E27	25
	Incandescent	E27	40
	Essential	E27	8
	Essential	E27	11
	Genie	E27	8
	Genie	E27	11
	Genie	E27	14

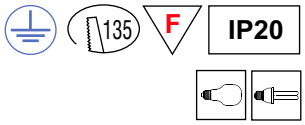




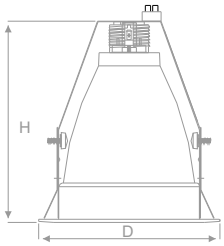


RD 150 SV

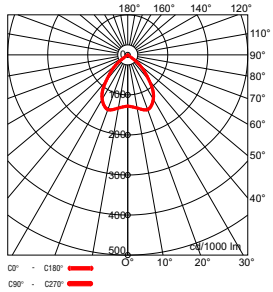
Name	Lamp	Lamp Holder	W
RD 150 SV	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Essential	E27	11



DIMENSION (mm)		
D	D1	H
175	140	175



Light Distribution Curve (Cd/1000Lm)

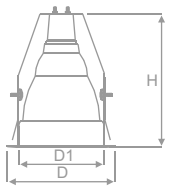




RD 150

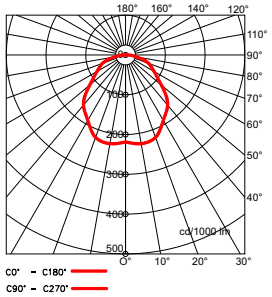
Name	Lamp	Lamp Holder	W
RD 150 E27	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Essential	E27	11





DIMENSION (mm)		
D	D1	H
175	140	175

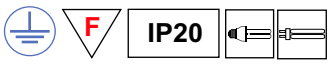
Light Distribution Curve (Cd/1000Lm)

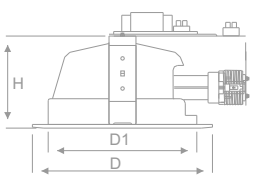




RD HORIZONTAL PRS

Name	Lamp	Lamp Holder	W
RD 150 HORIZ. PRS	PL-C	2xG24d	10
	PL-C	2xG24d	13
RD 175 HORIZ. PRS	PL-C	2xG24d	18
	Essential	2xE27	8
	Essential	2xE27	11

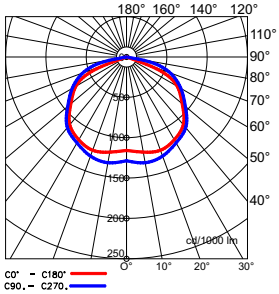




	DIMENSION (mm)		
	D	D1	H
150	175	140	105
175	200	168	105



Light Distribution Curve (Cd/1000Lm)

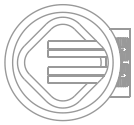


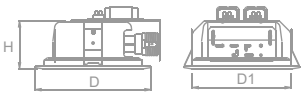


RD 175 HORIZONTAL RS

Name	Lamp	Lamp Holder	W
RD 175 HORIZONTAL RS	PL-C	2xG24d	10
		2xG24d	13
		2xG24d	18





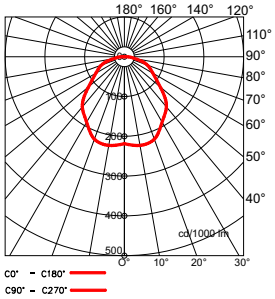


DIMENSION (mm)		
D	D1	H
196	167	82

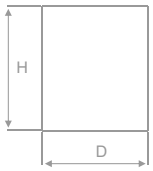
SM D 150

Name	Lamp	Lamp Holder	W
SM D 150	Incandescent	E27	40
		E27	60
	Essential	E27	14
		E27	18
		E27	23

Light Distribution Curve (Cd/1000Lm)



DIMENSION (mm)		
D	D1	H
174		225



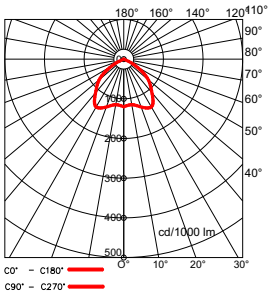




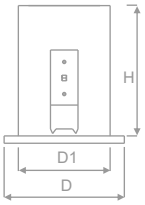
CD 5 BFRM

Name	Lamp	Lamp Holder	W
CD 5 BF RM	Incandescent	E27	25
		E27	40
		E27	60
	Essential	E27	8
		E27	14
		E27	18

Light Distribution Curve (Cd/1000Lm)



A2405		
D	D1	H
167	130	185

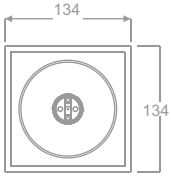


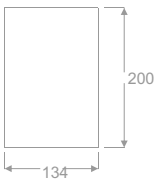




SM SQ 5

Name	Lamp	Lamp Holder	W
SM SQ 5 E27	Incandescent	E27	25
		E27	40
		E27	60
	Essential	E27	8
		E27	14

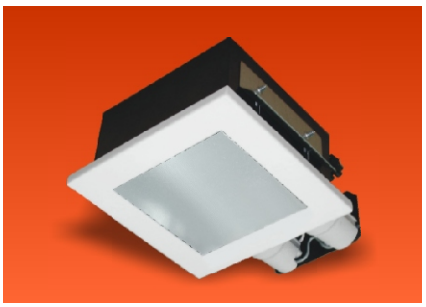


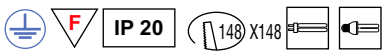




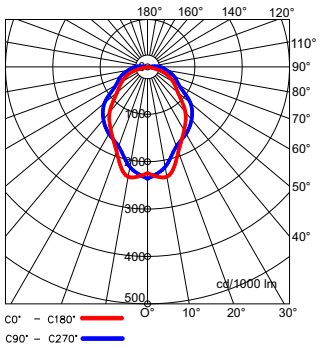
D 138 CHOTAC

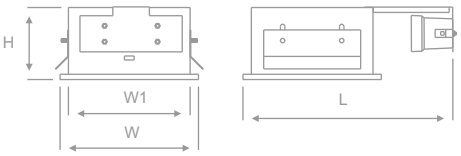
Name	Lamp	Lamp Holder	W
D 138 CHOTAC	Incandescent	2xE27	25
	Incandescent	2xE27	40
	Essential	2xE27	8
	Essential	2xE27	11
	PL-C	2xG24d	10
	PL-C	2xG24d	13
	PL-C	2xG24d	18



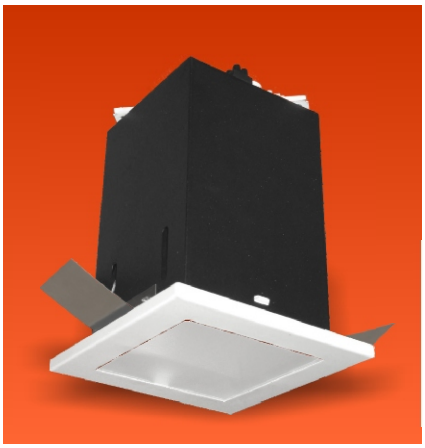


Light Distribution Curve (Cd/1000Lm)





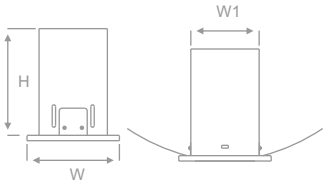
DIMENSION (mm)			
W	W1	H	L
157	138	84	235



D 125 CHOTAC

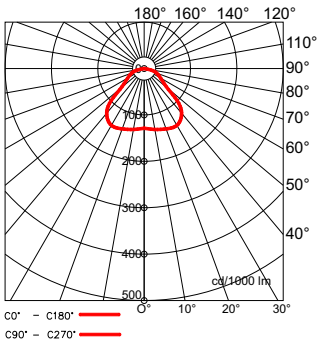
Name	Lamp	Lamp Holder	W
D 125 CHOTAC	Incandescent	E27	25
	Incandescent	E27	40
	Essential	E27	14
	Essential	E27	18
	PL-C	G24d	13
	PL-C	G24d	18





DIMENSION (mm)		
D	D1	H
165	122	190

Light Distribution Curve (Cd/1000Lm)

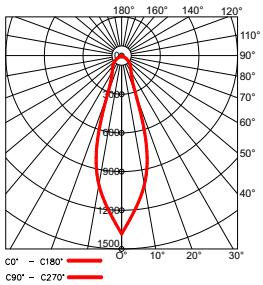


DO 3 HALOGEN

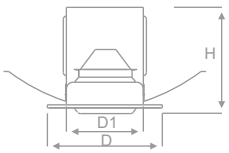
Name	Lamp	Lamp Holder	W
DO 3 HALOGEN	QR-CBC51	GU5.3	20
	QR-CBC51	GU5.3	35
	QR-CBC51	GU5.3	50

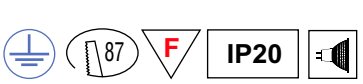


Light Distribution Curve (Cd/1000Lm)



DIMENSION (mm)		
D	D1	H
112	77	85



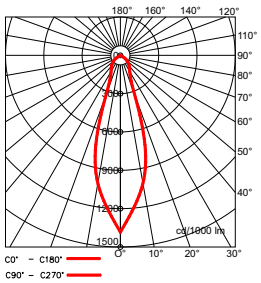


RD 2-1 HALOGEN

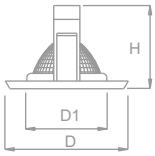
Name	Lamp	Lamp Holder	W
RD 2-1 HALOGEN	QR-CBC51	GU5.3	20
	QR-CBC51	GU5.3	35
	QR-CBC51	GU5.3	50

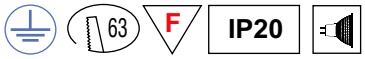


Light Distribution Curve (Cd/1000Lm)



DIMENSION (mm)		
D	D1	H
80	53	54



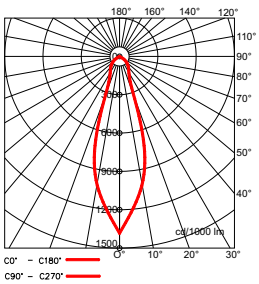


RD 3 HALOGEN BAFFLE

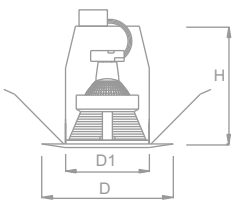
Name	Lamp	Lamp Holder	W
RD 3 HALOGEN BAFFLE	QR-CB 51	GU 5.3	20
	QR-CB 51	GU 5.3	35
	QR-CB 51	GU 5.3	50

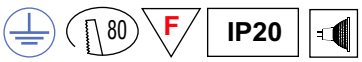


Light Distribution Curve (Cd/1000Lm)



DIMENSION (mm)		
D	D1	H
110	70	85

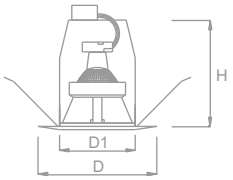




RD 3 HALOGEN REFF

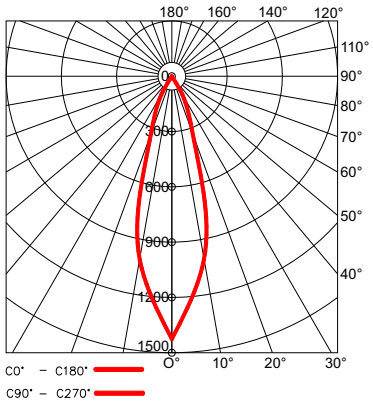
Name	Lamp	Lamp Holder	W
RD 3 HALOGEN REFF	QR-CBC51	GU5.3	20
	QR-CBC51	GU5.3	35
	QR-CBC51	GU5.3	50





DIMENSION (mm)		
D	D1	H
110	70	85

Light Distribution Curve (Cd/1000Lm)



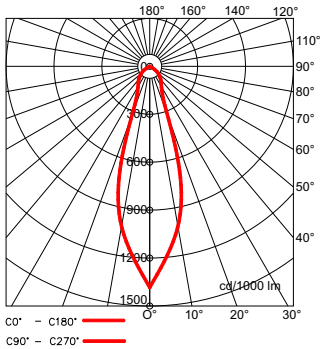
80 F IP20

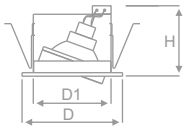
RWL 2-1 R HALOGEN

Name	Lamp	Lamp Holder	W
RWL 2-1 R HALOGEN	QT12	GY6.35	20
	QT12	GY6.35	35
	QT12	GY6.35	50
	QT12	GY6.35	75



Light Distribution Curve (Cd/1000Lm)



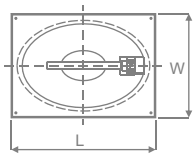


DIMENSION (mm)		
D	D1	H
86	68	50

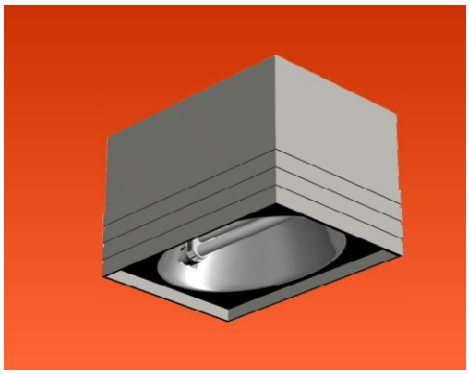
87 F IP20

SM SQ OPPALA

Name	Lamp	Lamp Holder	W
SM SQ OPPALA	PL PL-C PL-C	G23 G24d G24d	11 13 18



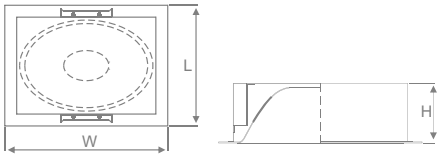
DIMENSION (mm)		
W	L	H
281	208	82



F IP20

RD SQ OPPALA 1

Name	Lamp	Lamp Holder	W
RD SQ OPPALA 1	PL PL-C PL-C	G23 G24d G24d	11 13 18



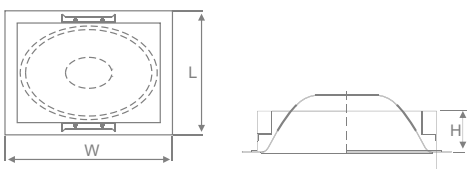
DIMENSION (mm)		
W	L	H
281	208	82



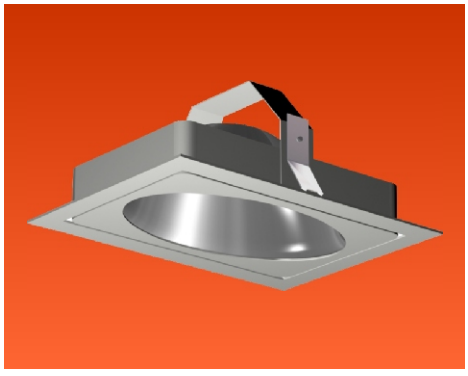
F IP20

RD SQ OPPALA 2

Name	Lamp	Lamp Holder	W
RD SQ OPPALA 2	PL PL-C PL-C	G23 G24d G24d	11 13 18



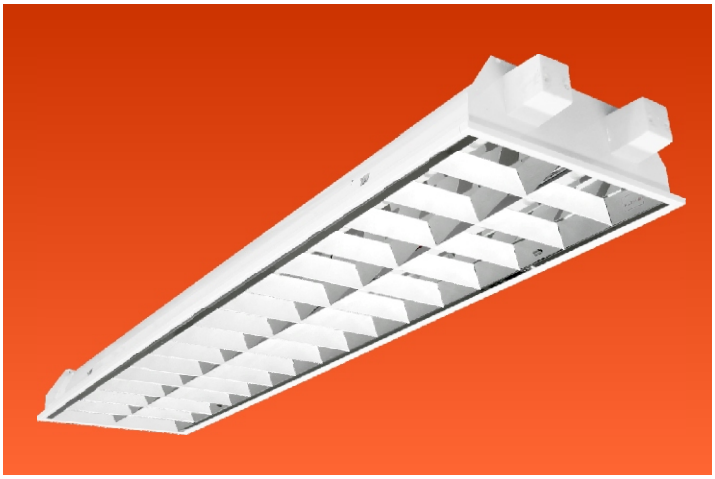
DIMENSION (mm)		
W	L	H
281	208	40



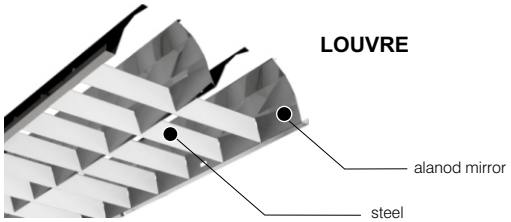
F IP20

RM 300 GLOSS ALML

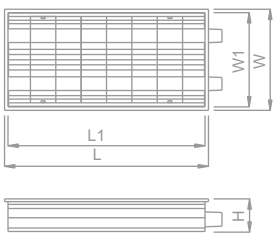
Name	Lamp	Lamp Holder	W
RM 300 GLOSS 2X18 ALML (M1)	T8	G13	18
RM 300 GLOSS 3X18 ALML (M1)	T8	G13	18
RM 300 GLOSS 4X18 ALML (M1)	T8	G13	18
RM 300 GLOSS 2X36 ALML (M1)	T8	G13	36
RM 300 GLOSS 3X36 ALML (M1)	T8	G13	36
RM 300 GLOSS 4X36 ALML (M1)	T8	G13	36



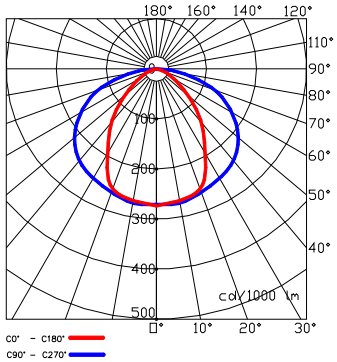
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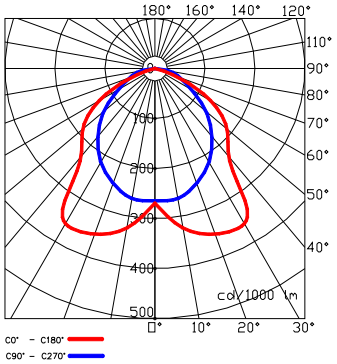


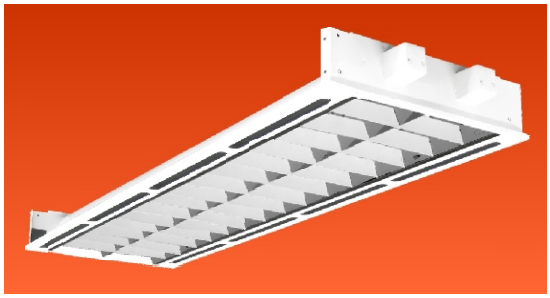
TYPE	DIMENSION (mm)				
	W	W1	L	L1	H
2 X 18	295	275	595	575	95
3 X 18	595	575	595	575	95
4 X 18	595	575	595	575	95
2 X 36	295	275	1195	1175	95
3 X 36	595	575	1195	1175	95
4 X 36	595	575	1195	1175	95



Light Distribution Curve (Cd/1000Lm)



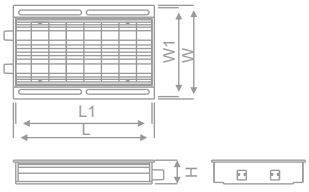


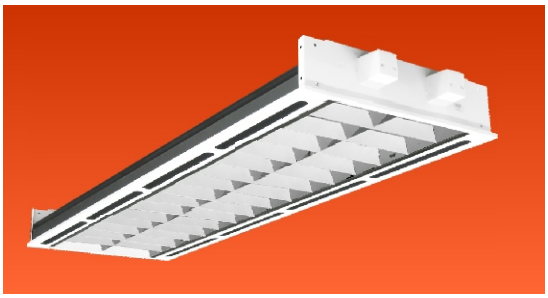


RMI 300 GLOSS ALML + DUMMY

DUMMY

TYPE	DIMENSION (mm)				
	W	W1	L	L1	H
2 X 18	395	375	595	575	95
3 X 18	595	575	595	575	95
4 X 18	595	575	595	575	95
2 X 36	395	375	1195	1175	95
3 X 36	595	575	1195	1175	95
4 X 36	595	575	1195	1175	95

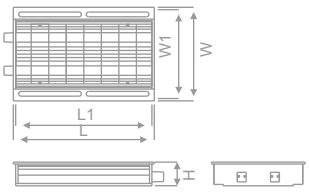


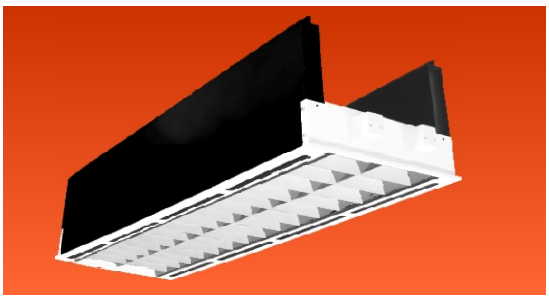


RMI 300 GLOSS ALML + RETURN AIR

RETURN

TYPE	DIMENSION (mm)				
	W	W1	L	L1	H
2 X 18	395	375	595	575	95
3 X 18	595	575	595	575	95
4 X 18	595	575	595	575	95
2 X 36	395	375	1195	1175	95
3 X 36	595	575	1195	1175	95
4 X 36	595	575	1195	1175	95

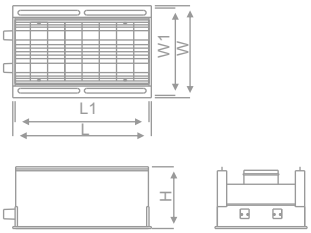


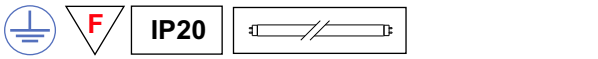


RMI 300 GLOSS ALML + DIFFUSER AC

DIFFUSER AC

TYPE	DIMENSION (mm)				
	W	W1	L	L1	H
2 X 18	395	375	595	575	95
3 X 18	595	575	595	575	95
4 X 18	595	575	595	575	95
2 X 36	395	375	1195	1175	95
3 X 36	595	575	1195	1175	95
4 X 36	595	575	1195	1175	95



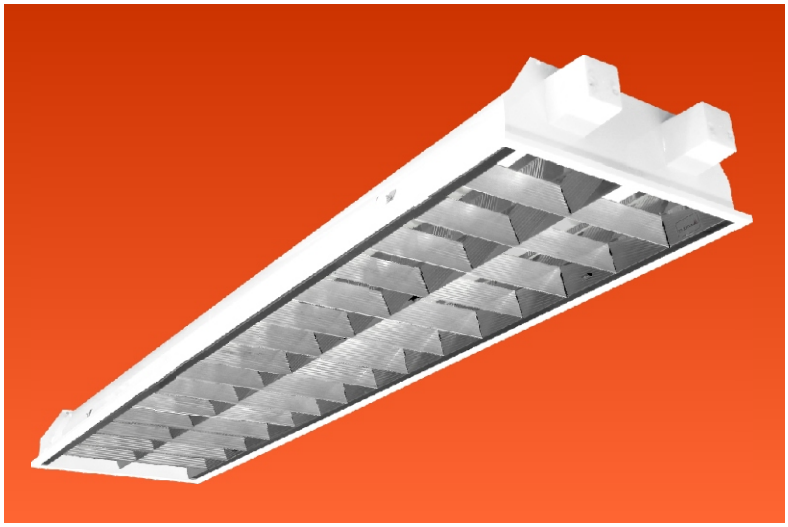


RM 300 GLOSS ALML INTEGRATED

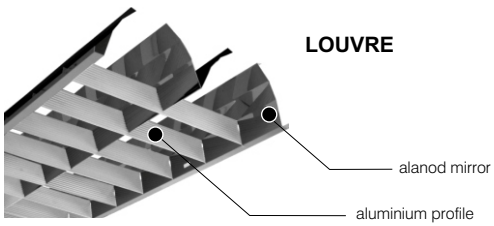
Name	*Lamp*	*Lamp Holder*	*W*
RMI 300 GLOSS 2X18 ALML (M1) DUMMY	T8	G 13	18
RMI 300 GLOSS 3X18 ALML (M1) DUMMY	T8	G 13	18
RMI 300 GLOSS 4X18 ALML (M1) DUMMY	T8	G 13	18
RMI 300 GLOSS 2X36 ALML (M1) DUMMY	T8	G 13	36
RMI 300 GLOSS 3X36 ALML (M1) DUMMY	T8	G 13	36
RMI 300 GLOSS 4X36 ALML (M1) DUMMY	T8	G 13	36
RMI 300 GLOSS 2X18 ALML (M1) RETURN	T8	G 13	18
RMI 300 GLOSS 3X18 ALML (M1) RETURN	T8	G 13	18
RMI 300 GLOSS 4X18 ALML (M1) RETURN	T8	G 13	18
RMI 300 GLOSS 2X36 ALML (M1) RETURN	T8	G 13	36
RMI 300 GLOSS 3X36 ALML (M1) RETURN	T8	G 13	36
RMI 300 GLOSS 4X36 ALML (M1) RETURN	T8	G 13	36
RMI 300 GLOSS 2X18 ALML (M1) DIFFUSER AC	T8	G 13	18
RMI 300 GLOSS 3X18 ALML (M1) DIFFUSER AC	T8	G 13	18
RMI 300 GLOSS 4X18 ALML (M1) DIFFUSER AC	T8	G 13	18
RMI 300 GLOSS 2X36 ALML (M1) DIFFUSER AC	T8	G 13	36
RMI 300 GLOSS 3X36 ALML (M1) DIFFUSER AC	T8	G 13	36
RMI 300 GLOSS 4X36 ALML (M1) DIFFUSER AC	T8	G 13	36

RM 300 GLOSS M2

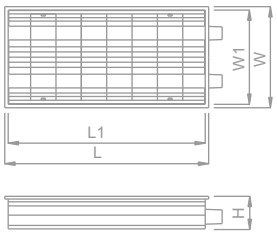
Name	Lamp	Lamp Holder	W
RM 300 GLOSS 2X18 STRIP (M2)	T8	G 13	18
RM 300 GLOSS 3X18 STRIP (M2)	T8	G 13	18
RM 300 GLOSS 4X18 STRIP (M2)	T8	G 13	18
RM 300 GLOSS 2X36 STRIP (M2)	T8	G 13	36
RM 300 GLOSS 3X36 STRIP (M2)	T8	G 13	36
RM 300 GLOSS 4X36 STRIP (M2)	T8	G 13	36

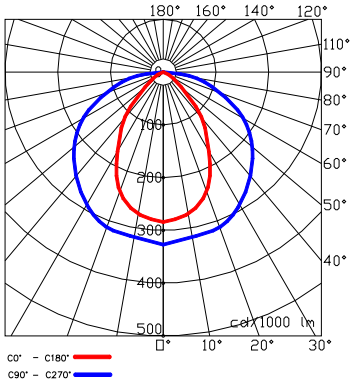


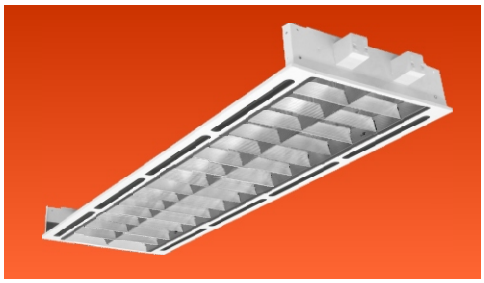
F IP20



TYPE	DIMENSION (mm)				
	W	W1	L	L1	H
2 X 18	295	275	595	575	95
3 X 18	595	575	595	575	95
4 X 18	595	575	595	575	95
2 X 36	295	275	1195	1175	95
3 X 36	595	575	1195	1175	95
4 X 36	595	575	1195	1175	95



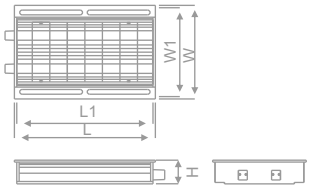


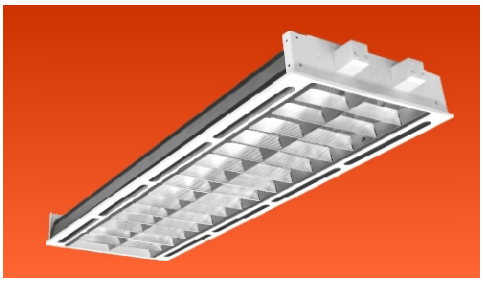


RMI 300 GLOSS STRIP + DUMMY

DUMMY

TYPE	DIMENSION (mm)				
	W	W1	L	L1	H
2 X 18	395	375	595	575	95
3 X 18	595	575	595	575	95
4 X 18	595	575	595	575	95
2 X 36	395	375	1195	1175	95
3 X 36	595	575	1195	1175	95
4 X 36	595	575	1195	1175	95

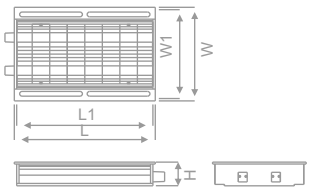


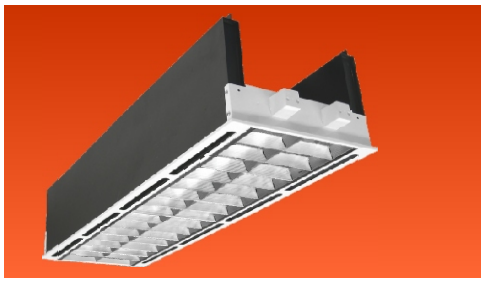


RMI 300 GLOSS STRIP + RETURN AIR

RETURN

TYPE	DIMENSION (mm)				
	W	W1	L	L1	H
2 X 18	395	375	595	575	95
3 X 18	595	575	595	575	95
4 X 18	595	575	595	575	95
2 X 36	395	375	1195	1175	95
3 X 36	595	575	1195	1175	95
4 X 36	595	575	1195	1175	95

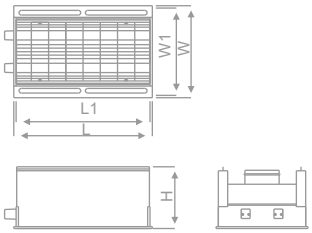


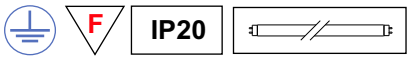


RMI 300 GLOSS STRIP + DIFFUSER AC

DIFFUSER AC

TYPE	DIMENSION (mm)				
	W	W1	L	L1	H
2 X 18	395	375	595	575	95
3 X 18	595	575	595	575	95
4 X 18	595	575	595	575	95
2 X 36	395	375	1195	1175	95
3 X 36	595	575	1195	1175	95
4 X 36	595	575	1195	1175	95



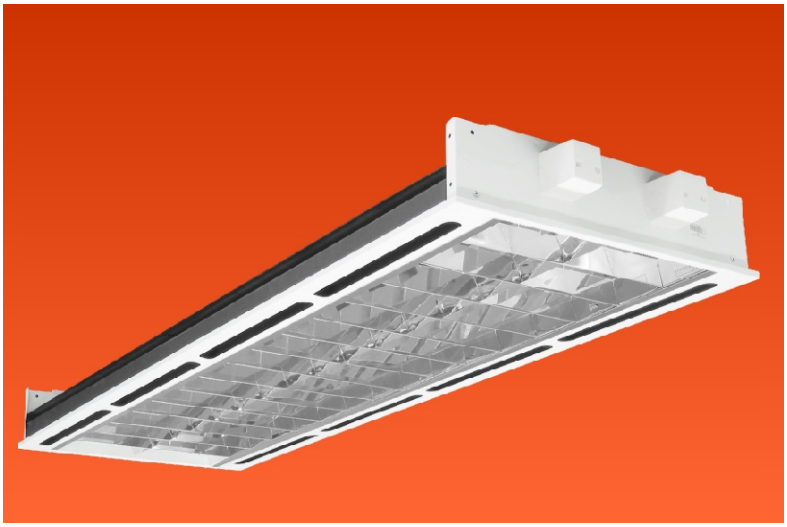


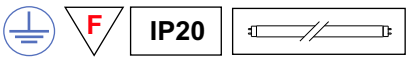
RM 300 GLOSS M2 INTEGRATED

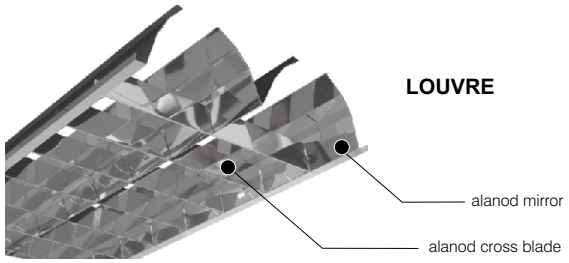
Name	*Lamp*	*Lamp Holder*	*W*
RMI 300 GLOSS 2X18 STRIP (M2) RETURN	T8	G 13	18
RMI 300 GLOSS 3X18 STRIP (M2) RETURN	T8	G 13	18
RMI 300 GLOSS 4X18 STRIP (M2) RETURN	T8	G 13	18
RMI 300 GLOSS 2X36 STRIP (M2) RETURN	T8	G 13	36
RMI 300 GLOSS 3X36 STRIP (M2) RETURN	T8	G 13	36
RMI 300 GLOSS 4X36 STRIP (M2) RETURN	T8	G 13	36
RMI 300 GLOSS 2X18 STRIP (M2) DUMMY	T8	G 13	18
RMI 300 GLOSS 3X18 STRIP (M2) DUMMY	T8	G 13	18
RMI 300 GLOSS 4X18 STRIP (M2) DUMMY	T8	G 13	18
RMI 300 GLOSS 2X36 STRIP (M2) DUMMY	T8	G 13	36
RMI 300 GLOSS 3X36 STRIP (M2) DUMMY	T8	G 13	36
RMI 300 GLOSS 4X36 STRIP (M2) DUMMY	T8	G 13	36
RMI 300 GLOSS 2X18 STRIP (M2) DIFFUSER AC	T8	G 13	18
RMI 300 GLOSS 3X18 STRIP (M2) DIFFUSER AC	T8	G 13	18
RMI 300 GLOSS 4X18 STRIP (M2) DIFFUSER AC	T8	G 13	18
RMI 300 GLOSS 2X36 STRIP (M2) DIFFUSER AC	T8	G 13	36
RMI 300 GLOSS 3X36 STRIP (M2) DIFFUSER AC	T8	G 13	36
RMI 300 GLOSS 4X36 STRIP (M2) DIFFUSER AC	T8	G 13	36

RM 300 GLOSS M4

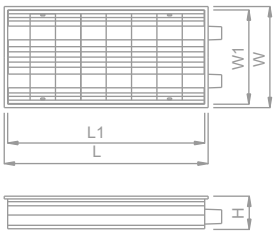
Name	Lamp	Lamp Holder	W
RM 300 GLOSS 2X18 DIVIDER (M4)	T8	G 13	18
RM 300 GLOSS 3X18 DIVIDER (M4)	T8	G 13	18
RM 300 GLOSS 4X18 DIVIDER (M4)	T8	G 13	18
RM 300 GLOSS 2X36 DIVIDER (M4)	T8	G 13	36
RM 300 GLOSS 3X36 DIVIDER (M4)	T8	G 13	36
RM 300 GLOSS 4X36 DIVIDER (M4)	T8	G 13	36

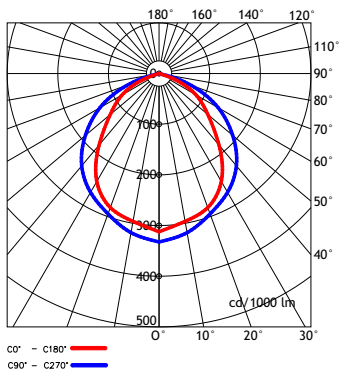


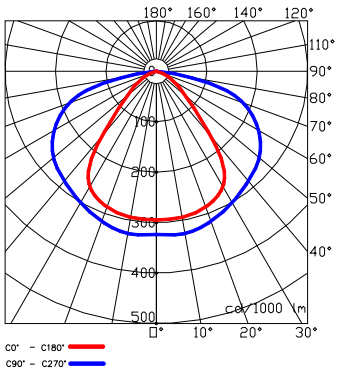




TYPE	DIMENSION (mm)				
	W	W1	L	L1	H
2 X 18	295	275	595	575	95
3 X 18	595	575	595	575	95
4 X 18	595	575	595	575	95
2 X 36	295	275	1195	1175	95
3 X 36	595	575	1195	1175	95
4 X 36	595	575	1195	1175	95





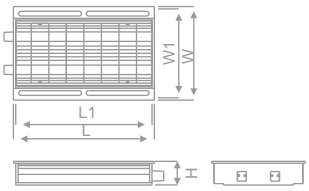




RMI 300 GLOSS DIVIDER + DUMMY

DUMMY

TYPE	DIMENSION (mm) W	W1	L	L1	H
2 X 18	395	375	595	575	95
3 X 18	595	575	595	575	95
4 X 18	595	575	595	575	95
2 X 36	395	375	1195	1175	95
3 X 36	595	575	1195	1175	95
4 X 36	595	575	1195	1175	95

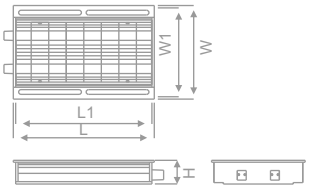


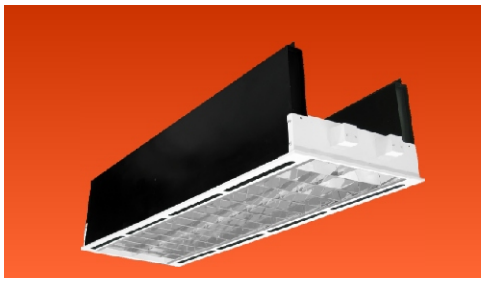


RMI 300 GLOSS DIVIDER + RETURN AIR

RETURN

TYPE	DIMENSION (mm) W	W1	L	L1	H
2 X 18	395	375	595	575	95
3 X 18	595	575	595	575	95
4 X 18	595	575	595	575	95
2 X 36	395	375	1195	1175	95
3 X 36	595	575	1195	1175	95
4 X 36	595	575	1195	1175	95

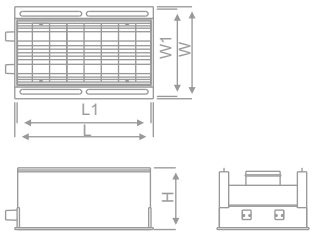


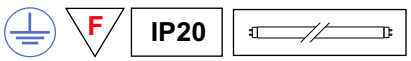


RMI 300 GLOSS DIVIDER + DIFFUSER AC

DIFFUSER AC

TYPE	DIMENSION (mm) W	W1	L	L1	H
2 X 18	395	375	595	575	95
3 X 18	595	575	595	575	95
4 X 18	595	575	595	575	95
2 X 36	395	375	1195	1175	95
3 X 36	595	575	1195	1175	95
4 X 36	595	575	1195	1175	95





RM 300 GLOSS M4 INTEGRATED

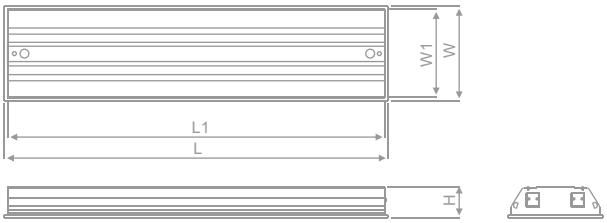
Name	*Lamp*	*Lamp Holder*	*W*
RMI 300 GLOSS 2X18 DIVIDER (M4) DUMMY	T8	G 13	18
RMI 300 GLOSS 3X18 DIVIDER (M4) DUMMY	T8	G 13	18
RMI 300 GLOSS 4X18 DIVIDER (M4) DUMMY	T8	G 13	18
RMI 300 GLOSS 2X36 DIVIDER (M4) DUMMY	T8	G 13	36
RMI 300 GLOSS 3X36 DIVIDER (M4) DUMMY	T8	G 13	36
RMI 300 GLOSS 4X36 DIVIDER (M4) DUMMY	T8	G 13	36
RMI 300 GLOSS 2X18 DIVIDER (M4) RETURN	T8	G 13	18
RMI 300 GLOSS 3X18 DIVIDER (M4) RETURN	T8	G 13	18
RMI 300 GLOSS 4X18 DIVIDER (M4) RETURN	T8	G 13	18
RMI 300 GLOSS 2X36 DIVIDER (M4) RETURN	T8	G 13	36
RMI 300 GLOSS 3X36 DIVIDER (M4) RETURN	T8	G 13	36
RMI 300 GLOSS 4X36 DIVIDER (M4) RETURN	T8	G 13	36
RMI 300 GLOSS 2X18 DIVIDER (M4) DIFFUSER AC	T8	G 13	18
RMI 300 GLOSS 3X18 DIVIDER (M4) DIFFUSER AC	T8	G 13	18
RMI 300 GLOSS 4X18 DIVIDER (M4) DIFFUSER AC	T8	G 13	18
RMI 300 GLOSS 2X36 DIVIDER (M4) DIFFUSER AC	T8	G 13	36
RMI 300 GLOSS 3X36 DIVIDER (M4) DIFFUSER AC	T8	G 13	36
RMI 300 GLOSS 4X36 DIVIDER (M4) DIFFUSER AC	T8	G 13	36

RMO

Name	Lamp	Lamp Holder	W
RMO 2X18	T8	G 13	18
RMO 3X18	T8	G 13	18
RMO 4X18	T8	G 13	18
RMO 2X36	T8	G 13	36
RMO 3X36	T8	G 13	36
RMO 4X36	T8	G 13	36



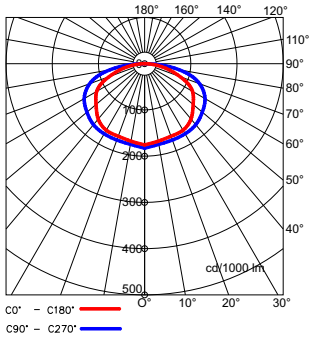
F IP20



DIMENSION (mm)

TYPE	L	L1	W	W1	H
2X18	645	615	295	275	95
3X18	645	615	595	575	95
4X18	645	615	595	575	95
2X36	1252	1222	295	275	95
3X36	1252	1222	595	575	95
4X36	1252	1222	595	575	95

Light Distribution Curve (Cd/1000Lm)





RMOT

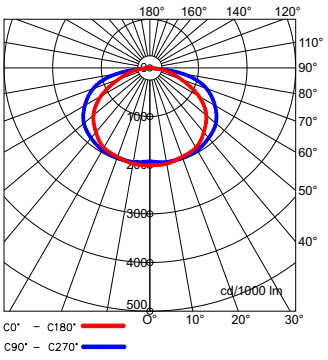
Name	Lamp	Lamp Holder	W
RMOT 2X18	TL-D	G13	18
RMOT 3X18	TL-D	G13	18
RMOT 4X18	TL-D	G13	18
RMOT 2X36	TL-D	G13	36
RMOT 3X36	TL-D	G13	36
RMOT 4X36	TL-D	G13	36

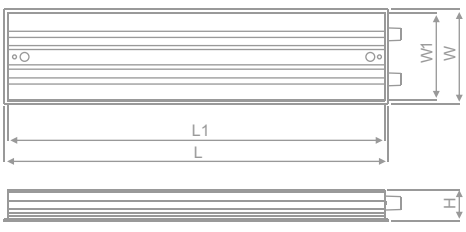
F IP20

DIMENSION (mm)

TYPE	L	L1	W	W1	H
2X18	595	575	295	275	95
3X18	595	575	595	575	95
4X18	595	575	595	575	95
2X36	1195	1175	295	275	95
3X36	1195	1175	595	575	95
4X36	1195	1175	595	575	95

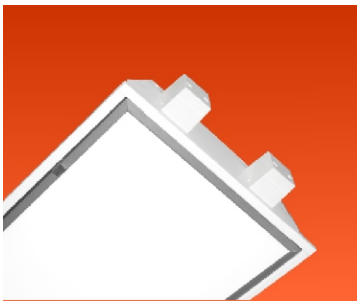
Light Distribution Curve (Cd/1000Lm)



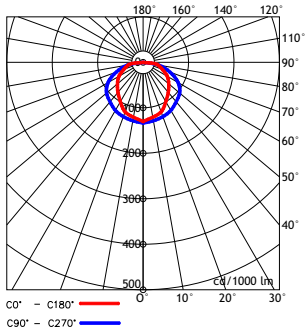


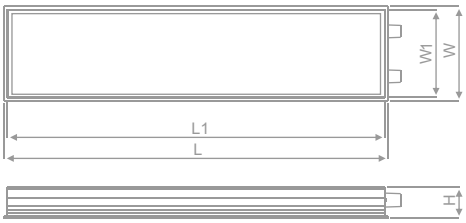
RM 300 ACR

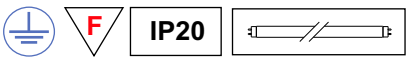
Name	Lamp	Lamp Holder	W
RM 300 ACR 2X18	TL-D	G13	18
RM 300 ACR 3X18	TL-D	G13	18
RM 300 ACR 4X18	TL-D	G13	18
RM 300 ACR 2X36	TL-D	G13	36
RM 300 ACR 3X36	TL-D	G13	36
RM 300 ACR 4X36	TL-D	G13	36



Light Distribution Curve (Cd/1000Lm)







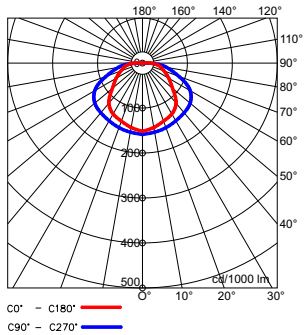
TYPE	L	L1	W	W1	H
2X18	595	575	295	275	95
3X18	595	575	595	575	95
4X18	595	575	595	575	95
2X36	1195	1175	295	275	95
3X36	1195	1175	595	575	95
4X36	1195	1175	595	575	95

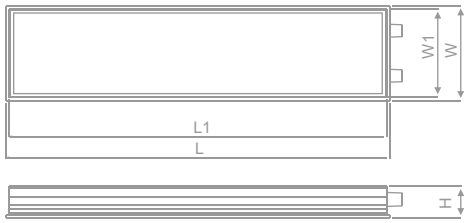
RM 300 AP

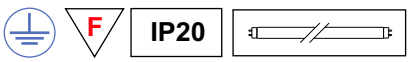
Name	Lamp	Lamp Holder	W
RM 300 AP 2X18	TL-D	G13	18
RM 300 AP 3X18	TL-D	G13	18
RM 300 AP 4X18	TL-D	G13	18
RM 300 AP 2X36	TL-D	G13	36
RM 300 AP 3X36	TL-D	G13	36
RM 300 AP 4X36	TL-D	G13	36



Light Distribution Curve (Cd/1000Lm)





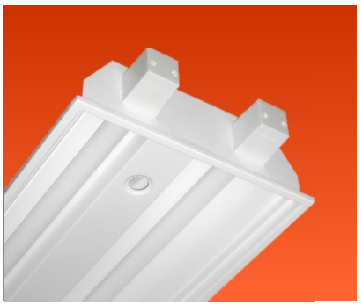


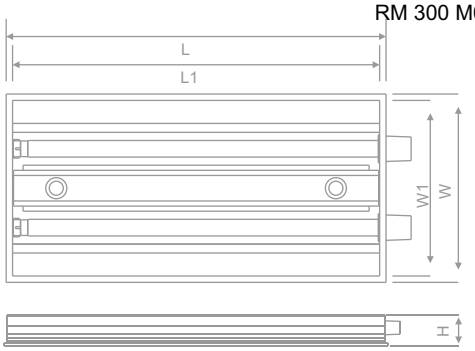
DIMENSION (mm)

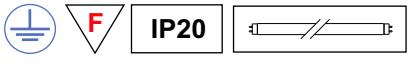
TYPE	L	L1	W	W1	H
2X18	595	575	295	275	95
3X18	595	575	595	575	95
4X18	595	575	595	575	95
2X36	1195	1175	295	275	95
3X36	1195	1175	595	575	95
4X36	1195	1175	595	575	95

RM 300 M0

Name	Lamp	Lamp Holder	W
RM 300 M0 2X18	TL-D	G13	18
RM 300 M0 3X18	TL-D	G13	18
RM 300 M0 4X18	TL-D	G13	18
RM 300 M0 2X36	TL-D	G13	36
RM 300 M0 3X36	TL-D	G13	36
RM 300 M0 4X36	TL-D	G13	36





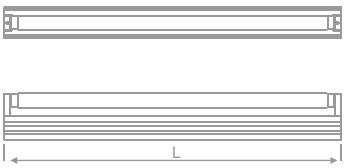


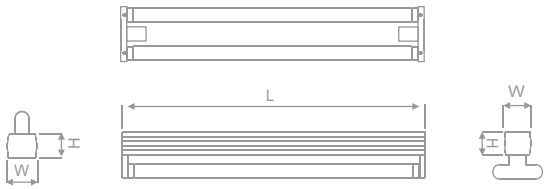


F IP20

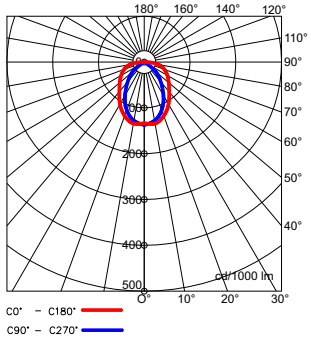
BL TG

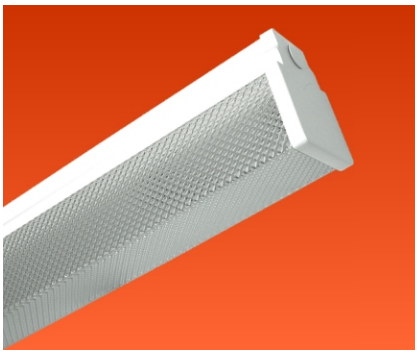
Name	Lamp	Lamp Holder	W
BL TG 1X18	TL-D	G13	18
BL TG 1X36	TL-D	G13	36
BL TG 2X18	TL-D	G13	18
BL TG 2X36	TL-D	G13	36





Light Distribution Curve (Cd/1000Lm)





F IP20

GMS TG

Name	Lamp	Lamp Holder	W
GMS TG 1X18	TL-D	G13	18
GMS TG 1X36	TL-D	G13	36
GMS TG 2X18	TL-D	G13	18
GMS TG 2X36	TL-D	G13	36

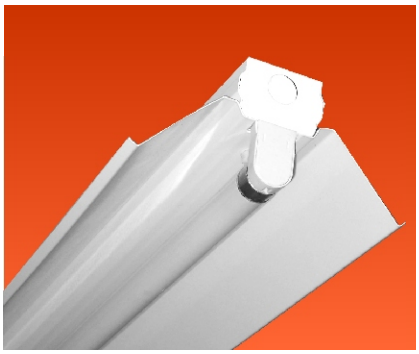
DIMENSION (mm)

TYPE	L	W	H
18 W	615	80	92
36 W	1222	80	92



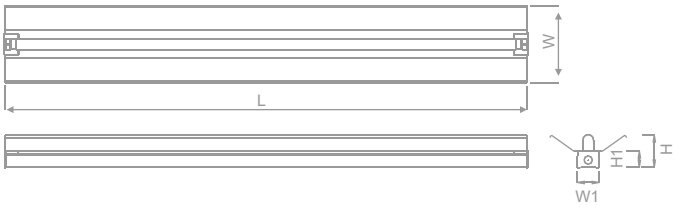
TK TG

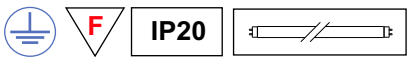
Name	Lamp	Lamp Holder	W
TK TG 1X18	TL-D	G13	18
TK TG 1X36	TL-D	G13	36



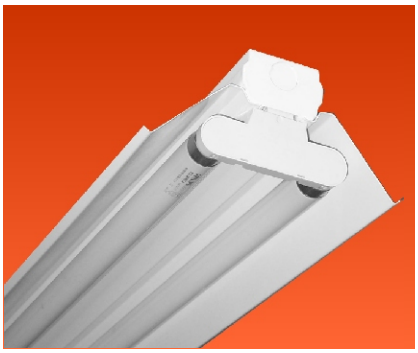
DIMENSION (mm)

TYPE	L	W1	W	H1	H
1X18	615	57	180	43	75
1X36	1222	57	180	43	75



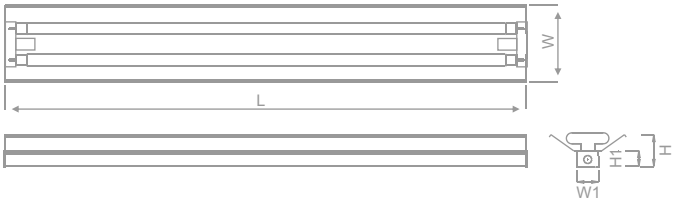


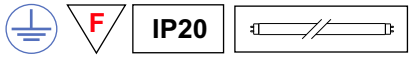
Name	Lamp	Lamp Holder	W
TK TG 2X18	TL-D	G13	18
TK TG 2X36	TL-D	G13	36



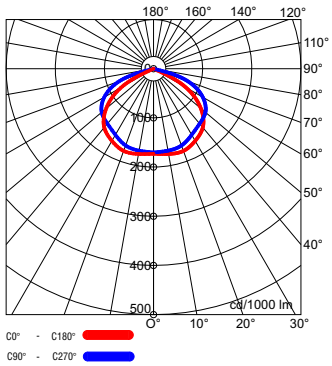
DIMENSION (mm)

TYPE	L	W1	W	H1	H
2X18	615	57	180	43	75
2X36	1222	57	180	43	75





Light Distribution Curve (Cd/1000Lm)

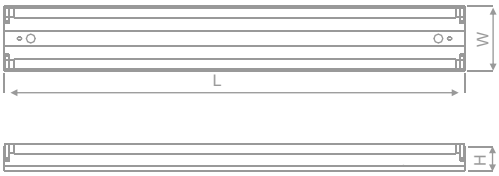




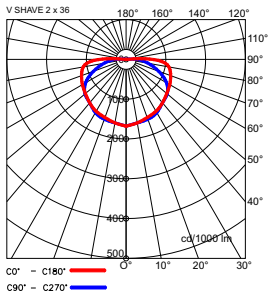
V SHAPE TP

Name	Lamp	Lamp Holder	W
V SHAPE TP 2X18	TL-D	G13	18
V SHAPE TP 2X36	TL-D	G13	36

F IP20

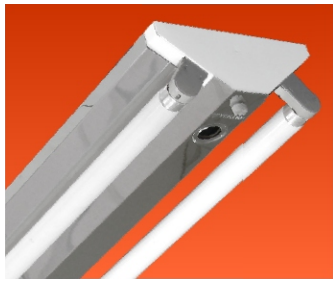


Light Distribution Curve (Cd/1000Lm)



DIMENSION (mm)

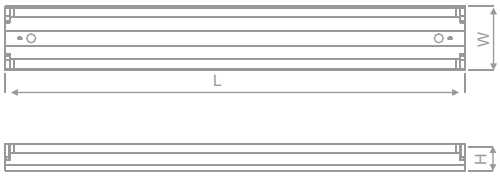
TYPE	L	W	H
2X18	615	170	65
2X36	1222	170	65



V SHAPE MIRROR

Name	Lamp	Lamp Holder	W
V SHAPE MIRROR 2X18	TL-D	G13	18
V SHAPE MIRROR 2X36	TL-D	G13	36

F IP20



DIMENSION (mm)

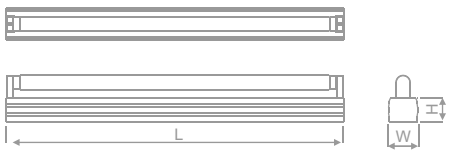
TYPE	L	W	H
2X18	615	170	65
2X36	1222	170	65



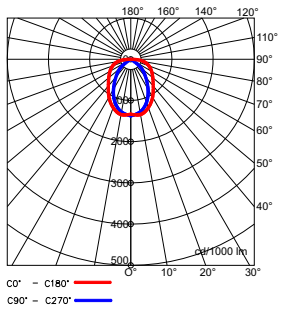
BL MAS

Name	Lamp	Lamp Holder	W
BL MAS 1X18	TL-D	G13	18
BL MAS 1X36	TL-D	G13	36

F IP20



Light Distribution Curve (Cd/1000Lm)

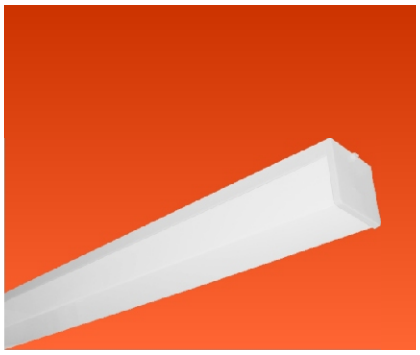


DIMENSION (mm)

TYPE	L	W	H
1X18	615	57	43
1X36	1222	57	43

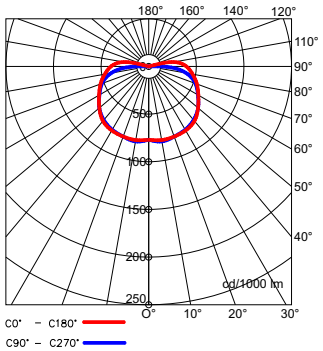
GMS TP

Name	Lamp	Lamp Holder	W
GMS TP 1X18	TL-D	G13	18
GMS TP 2X18	TL-D	G13	18
GMS TP 1X36	TL-D	G13	36
GMS TP 2X36	TL-D	G13	36



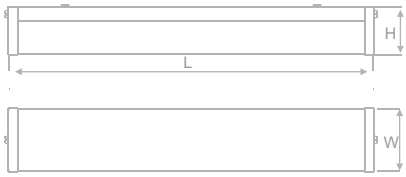
IP20

Light Distribution Curve (Cd/1000Lm)



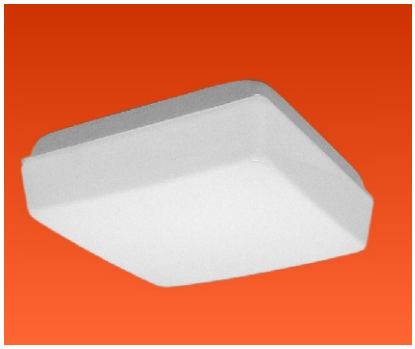
DIMENSION (mm)

TYPE	L	W	H
1X18	650	110	105
2X18	650	110	105
1X36	1260	110	105
2X36	1260	110	105



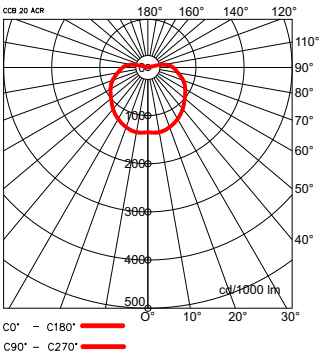
SCB ACR

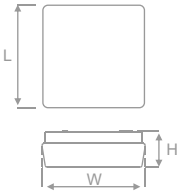
Name	Lamp	Lamp Holder	W
SCB 20 ACR	TL C	G10	20
SCB 32 ACR	TL C	G10	32



F IP20

Light Distribution Curve (Cd/1000Lm)





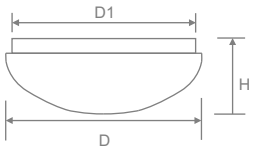
DIMENSION (mm)			
	W	L	H
SCB 20	240	240	95
SCB 32	330	330	100

SCCB ACR

Name	Lamp	Lamp Holder	W
SCCB 20 ACR	Incandescent Essential	E27 E27	25/40 8/14/18



DIMENSION (mm)		
D	D1	H
256	240	120

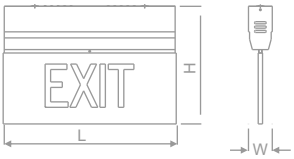




F IP20

EXIT GREEN

Name	Lamp	Lamp Holder	W
EXIT GREEN	T5	G5	8



DIMENSION (mm)		
L	W	H
400	57	271

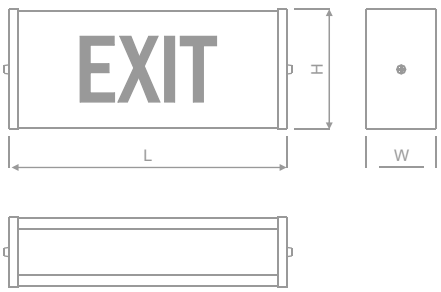
EXIT B

Name	Lamp	Lamp Holder	W
EXIT B	TL-D	G13	10



F IP20

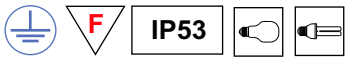
DIMENSION (mm)		
L	W	H
430	108	185

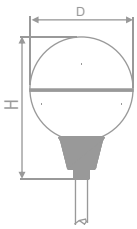




GL FULL GLOBE

Name	Lamp	Lamp Holder	W
GL FULL GLOBE 40	Incandescent	E27	40
	Incandescent	E27	60
	Incandescent	E27	75
	Incandescent	E27	100
	Essential	E27	18
	Essential	E27	23
	Ecotone	E27	45
	Ecotone	E27	65
	ML	E27	100
	ML	E27	160
	HPL-N	E27	50
	HPL-N	E27	80
	HPL-N	E27	125
	SON	E27	50
	SON	E27	70



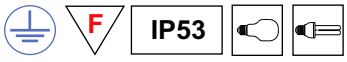


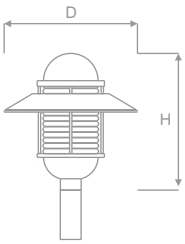
DIMENSION (mm)		
D		H
400		502

GL MINI CESSNA

Name	Lamp	Lamp Holder	W
GL MINI CESSNA	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Essential	E27	14
	Essential	E27	18
	Essential	E27	23





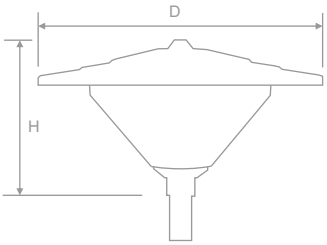


DIMENSION (mm)		
D		H
347		365

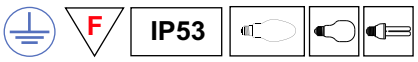


GL TOP ACR TRP

Name	Lamp	Lamp Holder	W
GL TOP ACR TRP	Incandescent	E27	75
	Incandescent	E27	100
	Ecotone	E27	45
	Ecotone	E27	65
	ML	E27	100
	ML	E27	160



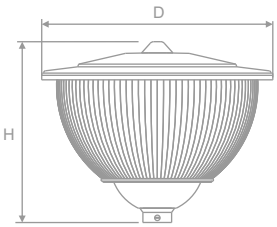
DIMENSION (mm)		
D		H
720		330



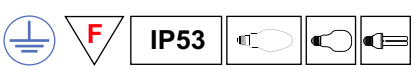
GL TOP ACR

Name	Lamp	Lamp Holder	W
GL TOP ACR	Incandescent	E27	75
	Incandescent	E27	100
	Ecotone	E27	45
	Ecotone	E27	65
	ML	E27	100
	ML	E27	160





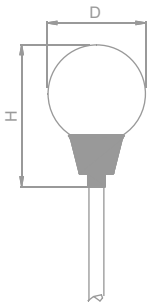
DIMENSION (mm)		
D		H
550		420



GL G

Name	Lamp	Lamp Holder	W
GL G E27	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	18
	Essential	E27	26
	Ecotone	E27	45
	Ecotone	E27	65
	ML	E27	100
	ML	E27	160
	HPL-N	E27	50
	HPL-N	E27	80
	HPL-N	E27	125
	SON	E27	50
	SON	E27	70





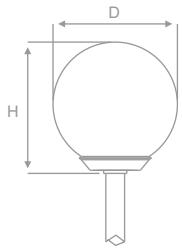
DIMENSION (mm)		
D		H
305		430

F IP53

GL E27

Name	Lamp	Lamp Holder	W
GL E27	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	18
	Essential	E27	26
	Ecotone	E27	45
	Ecotone	E27	65
	ML	E27	100
	ML	E27	160





DIMENSION (mm)		
D		H
Ø 11"	Ø 12"	
279	305	322

F IP53

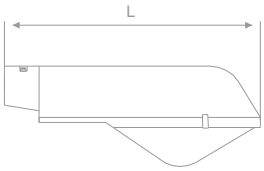
Savy

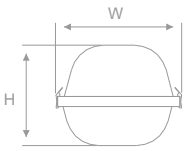
RL P

Name	Lamp	Lamp Holder	W
RL 01 P	SON	E40	150
	SON-T	E40	150
RL 02 P	HPL-N	E40	250
	SON	E40	250
	SON-T	E40	250
RL 03 P	HPL-N	E40	400
	SON	E40	400
	SON-T	E40	400

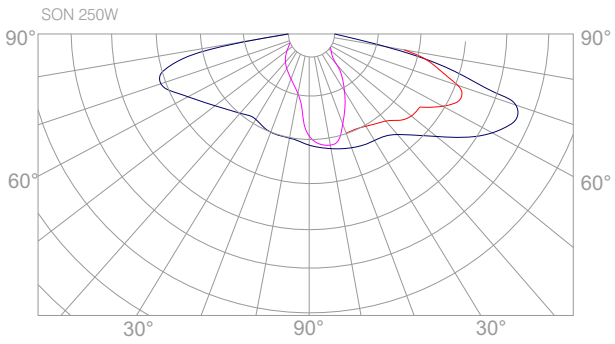






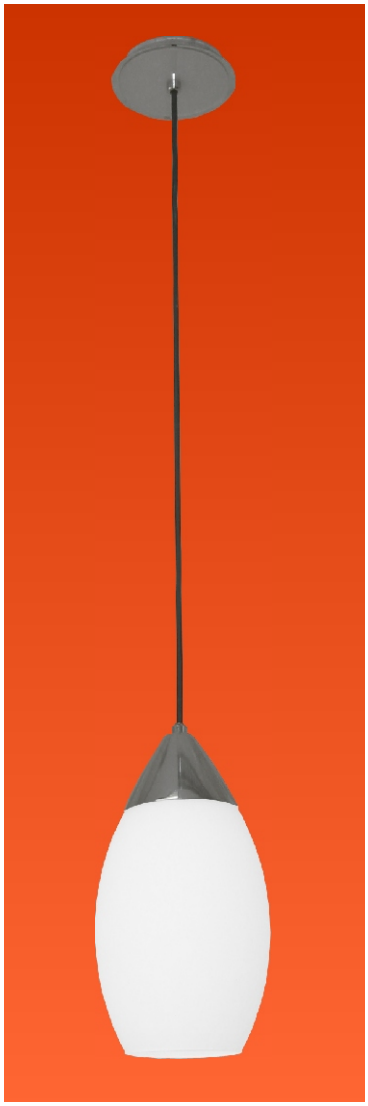


DIMENSION (mm)		
L	W	H
775	385	312

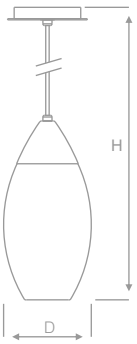


HLG GEOVANY

Name	Lamp	Lamp Holder	W
HLG GEOVANY C1	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Essential	E27	14
	Essential	E27	18
	Genie	E27	8
	Genie	E27	11
	Genie	E27	14



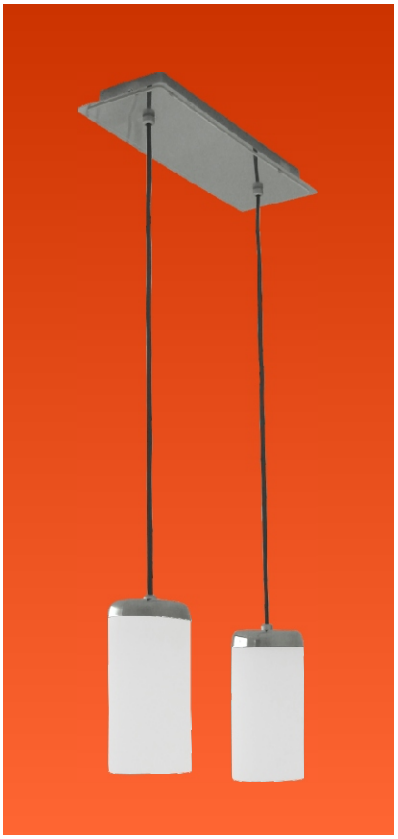
F IP 20



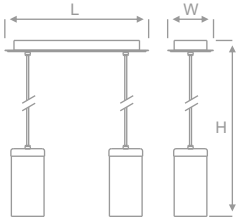
DIMENSION (mm)		
D		H
154		1255

HLG ELIZA 20

Name	Lamp	Lamp Holder	W
HLG ELIZA 20 C2 E27	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Essential	E27	14
	Essential	E27	18
	Genie	E27	8
	Genie	E27	11
	Genie	E27	14



F IP 20

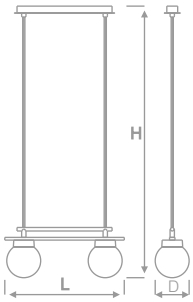


DIMENSION (mm)		
L	W	H
440	140	1150

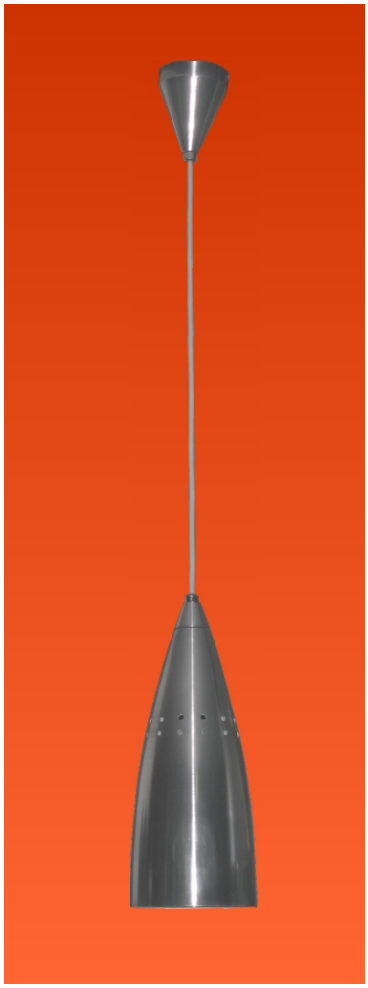
HLG CF BG 5

Name	Lamp	Lamp Holder	W
HLG CF BG 5 C2	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Essential	E27	14
	Essential	E27	18
	Genie	E27	8
	Genie	E27	11
	Genie	E27	14





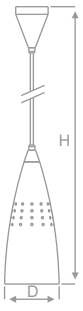
DIMENSION (mm)		
D	L	H
125	440	1000



F IP 20

HLG CF A

Name	Lamp	Lamp Holder	W
HLG CF A E27	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Essential	E27	14
	Essential	E27	18
	Genie	E27	8
	Genie	E27	11
	Genie	E27	14

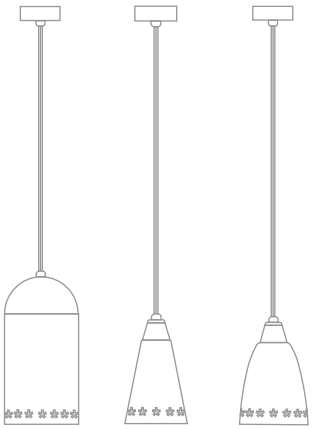


DIMENSION (mm)		
D		H
145		1000

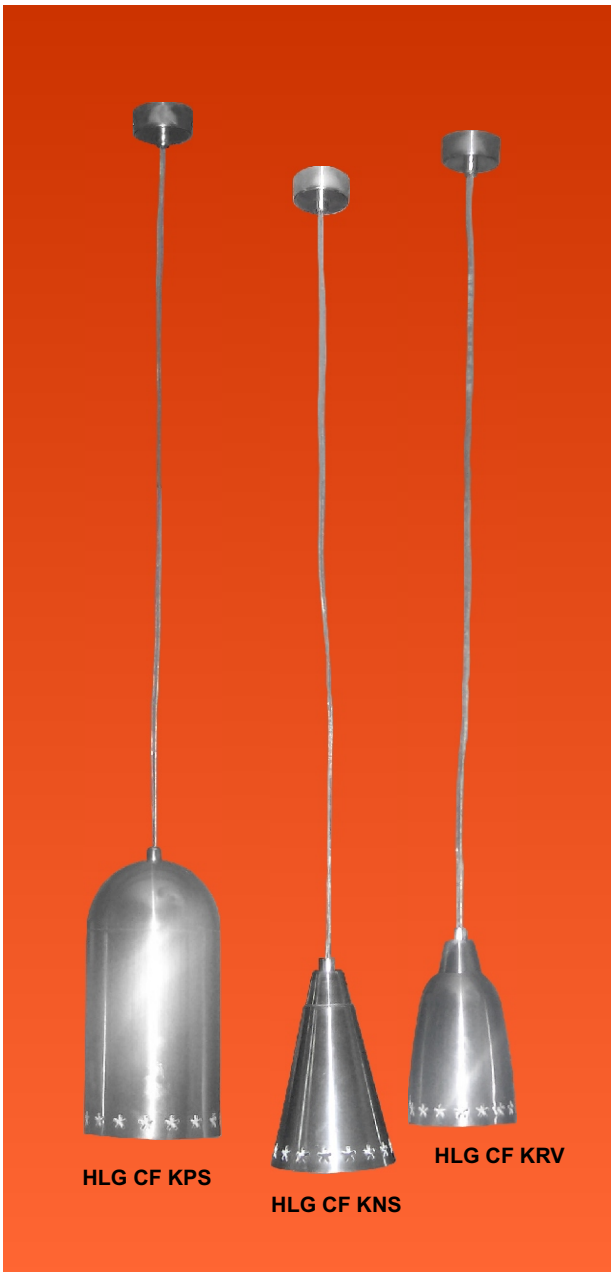
F IP 20

HLG CF KPS, KNS, KRV

Lamp	Lamp Holder	W
Incandescent	E27	25
Incandescent	E27	40
Incandescent	E27	60
Essential	E27	8
Genie	E27	11
Genie	E27	14

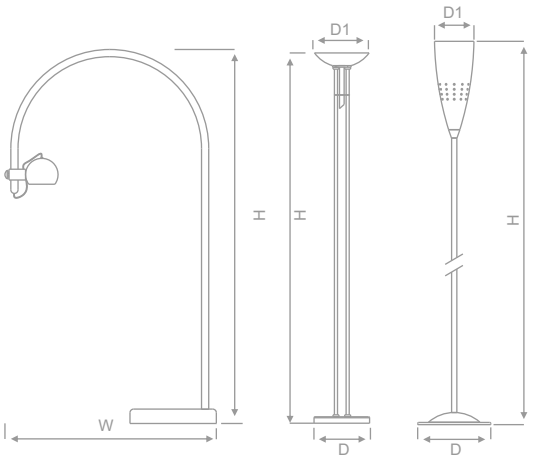


	DIMENSION (mm)	
	D	H
KPS	130	1000
KNS	106	1000
KRV	120	1000



IP 20

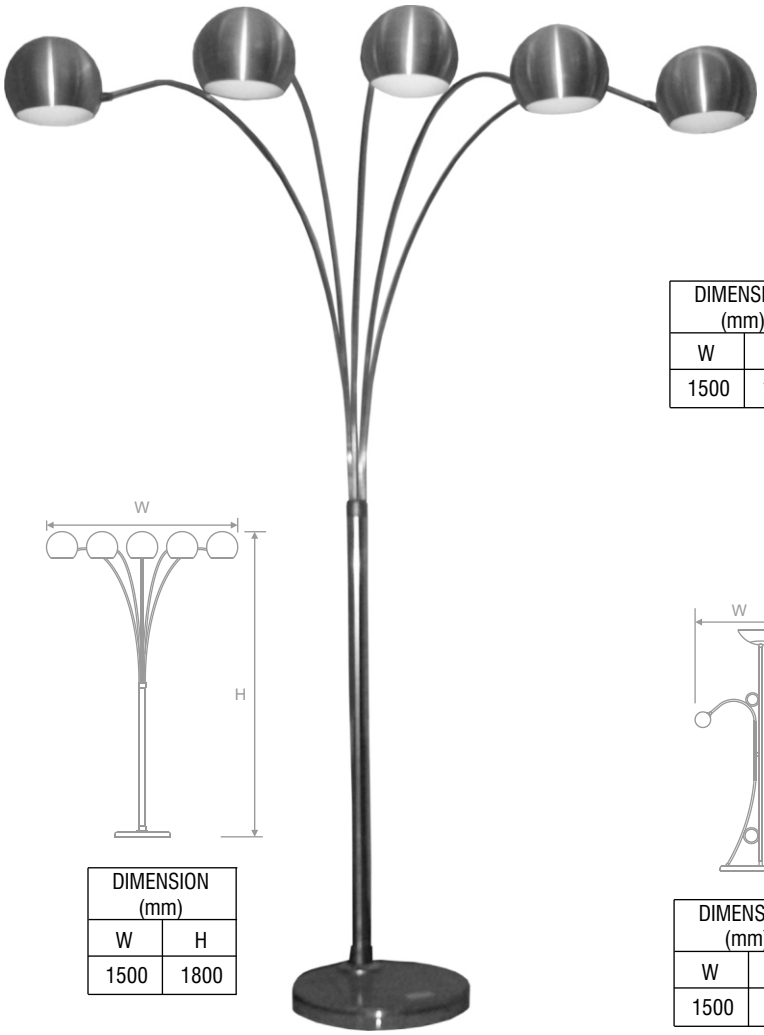
Name	Lamp	Lamp Holder	W
LS STALAKNIT E27	Halogen	R7s	60
	Halogen	R7s	100
	Halogen	R7s	150
	Halogen	R7s	200
LS LENGKUNG E27	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Genie	E27	11
	Genie	E27	14
LS CF A E27	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Genie	E27	11
	Genie	E27	14

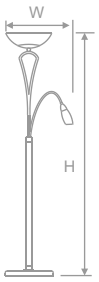


	DIMENSION (mm)			
	D	D1	H	W
LS LENGKUNG			1560	610
LS STALAKNIT	290	285	1690	
LS CF A	265	143	1550	



F IP 20

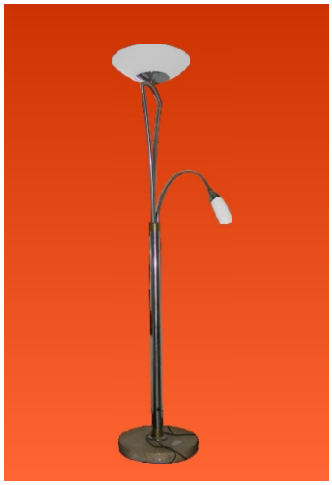




DIMENSION (mm)	
W	H
1500	1800

DIMENSION (mm)	
W	H
1500	1800

LS LAVENDER



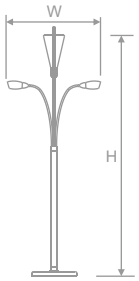
SL POLYANA E14

DIMENSION (mm)	
W	H
1500	1800

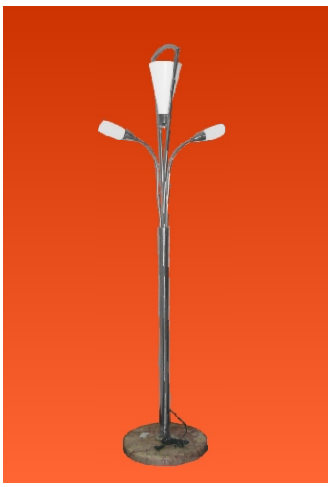


SL FLAMMEA E14

Name	*Lamp*	*Lamp Holder*	*W*
LS LAVENDER E27	Incandescent	E27	5X25
	Incandescent	E27	5X40
	Incandescent	E27	5X60
	Essential	E27	5X8
	Genie	E27	5X11
	Genie	E27	5X14
SL POLYANA E14	Incandescent	E27	60
	Incandescent	E14	40
SL FLAMMEA E14	Incandescent	E27	60
	Incandescent	E14	40
SL MAGNOLIA E14	Incandescent	E27	60
	Incandescent	E14	2X40

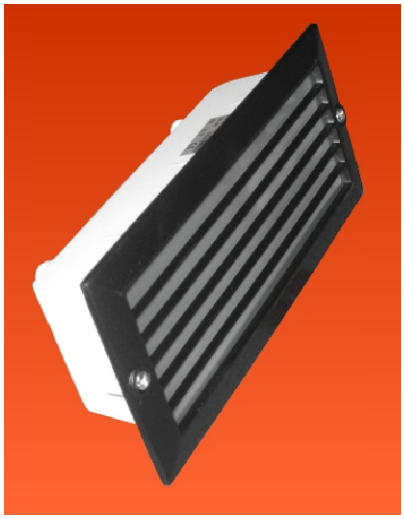


DIMENSION (mm)	
W	H
1500	1800



SL MAGNOLIA E14

Savy

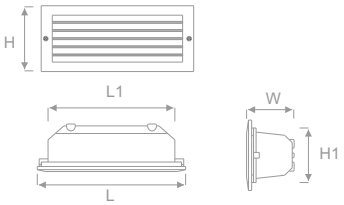


F IP20

WHL 008 A

Name	Lamp	Lamp Holder	W
WHL 008 A	Essential	E27	8
	Genie	E27	11
	Genie	E27	14

DIMENSION (mm)				
L	L1	W	H	H1
234	200	86	101	74



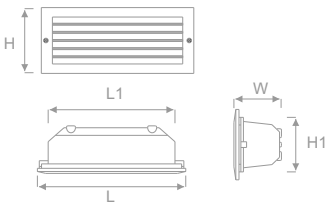


F IP20

WHL 008 B

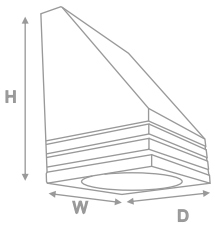
Name	Lamp	Lamp Holder	W
WHL 008 B	Essential	E27	8
	Genie	E27	11
	Genie	E27	14

DIMENSION (mm)				
L	L1	W	H	H1
234	200	86	101	74



WL OPPALE

Name	Lamp	Lamp Holder	W
WL OPPALE	MHN-TD	Rx7s	70
	MHN-TD	Rx7s	150
	CDM-TD	Rx7s	70
	CDM-TD	Rx7s	150

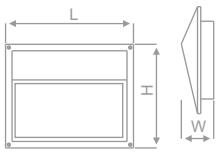


DIMENSION (mm)		
D	W	H
180	250	280

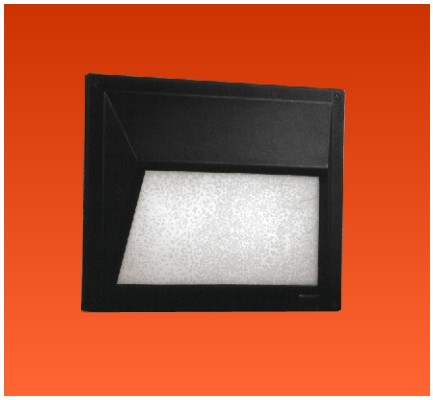


WL PARKING

Name	Lamp	Lamp Holder	W
WL PARKING	PL-S	G23	7
	PL-S	G23	9

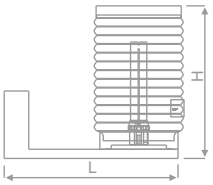


DIMENSION (mm)		
L	W	H
360	95	295

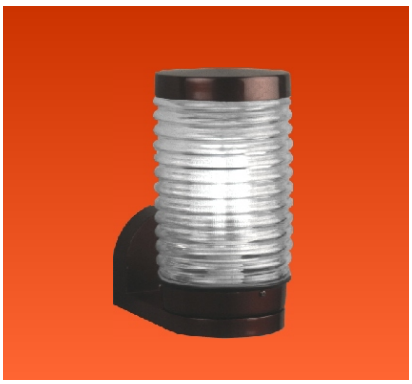


WL PILAR DAICO

Name	Lamp	Lamp Holder	W
WL PILAR DAICO	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Genie	E27	11
	Genie	E27	14



DIMENSION (mm)		
L		H
283.5		248

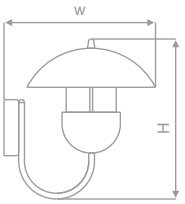




WL CANOPY

Name	Lamp	Lamp Holder	W
WL CANOPY E27	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Genie	E27	11
	Genie	E27	14

DIMENSION (mm)	
W	H
320	320

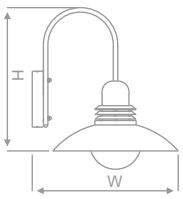




WL PARABOLA

Name	Lamp	Lamp Holder	W
WL PARABOLA	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Genie	E27	11
	Genie	E27	14

DIMENSION (mm)	
W	H
330	320

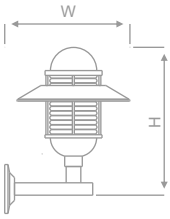




WL MINI CESSNA

Name	Lamp	Lamp Holder	W
WL MINI CESSNA	Incandescent	E27	25
	Incandescent	E27	40
	Incandescent	E27	60
	Essential	E27	8
	Genie	E27	11
	Genie	E27	14

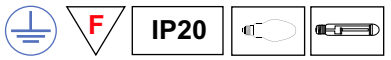
DIMENSION (mm)	
W	H
365	510



INDUSTRIAL LIGHT IB

Name	Lamp	Lamp Holder	W
INDUSTRIAL LIGHT IB D40 E27	ML	E27	100
INDUSTRIAL LIGHT IB D55 E27	ML	E27	160
	HPL-N	E27	80
	HPL-N	E27	125
	SON	E27	70
INDUSTRIAL LIGHT IB D40 E40	ML	E40	250
INDUSTRIAL LIGHT IB D55 E40	HPL-N	E40	250
	HPL-N	E40	400
	SON	E40	150
	SON	E40	250
	SON	E40	400



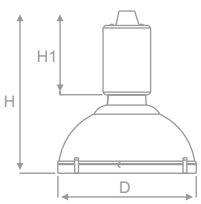


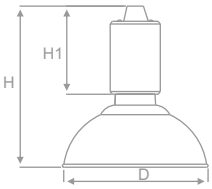
INDUSTRIAL LIGHT IB w/ GLASS COVER

Name	Lamp	Lamp Holder	W
INDUSTRIAL LIGHT IB D40 E27	ML	E27	100
INDUSTRIAL LIGHT IB D55 E27	ML	E27	160
	HPL-N	E27	80
	HPL-N	E27	125
	SON	E27	70
INDUSTRIAL LIGHT IB D40 E40	ML	E40	250
INDUSTRIAL LIGHT IB D55 E40	HPL-N	E40	250
	HPL-N	E40	400
	SON	E40	150
	SON	E40	250
	SON	E40	400
	HPI-BU	E40	250
	HPI-BU	E40	400





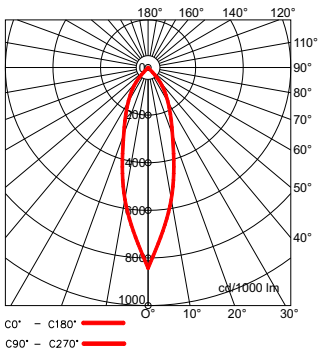




DIMENSION (mm)		
D	H	H1
535	620	330

DIMENSION (mm)		
D	H	H1
535	620	330

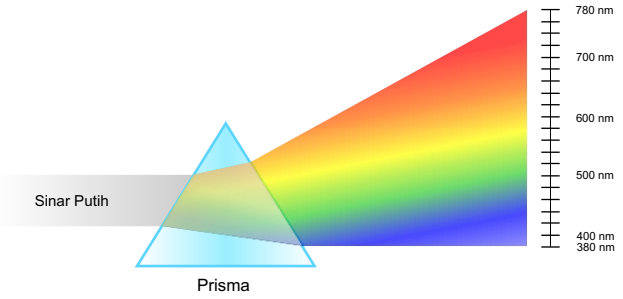
Light Distribution Curve (LUX)



CAHAYA & WARNA

Cahaya adalah gelombang elektromagnet dengan karakter yang unik karena memiliki dua sifat alam, sebagai gelombang dan sebagai partikel. Sebagai gelombang, radiasi cahaya yang berasal dari sebuah sumber cahaya bergerak dalam sebuah garis lurus sampai bertemu sebuah objek yang menghalanginya. Sebagai partikel, unit-unit cahaya tidak memiliki massa, tetapi keberadaannya dapat terdeteksi ketika unit-unit cahaya tersebut dalam keadaan bergerak.

Cahaya alam yang paling sering menjadi tolak ukur adalah cahaya matahari. Keberadaannya yang memungkinkan kita melihat semua benda pada siang hari kita anggap sebagai cahaya putih. Pada kenyataannya cahaya putih tersebut merupakan percampuran dari berbagai warna cahaya dalam spektrum cahaya. Hal ini dapat dilihat ketika kita melewatkan cahaya matahari pada sebuah prisma. Cahaya matahari yang berwarna putih akan terurai menjadi spektrum warna merah, oranye, kuning, hijau, biru & ungu. Dengan demikian percampuran berbagai spektrum warna tersebut akan menghasilkan cahaya berwarna putih.

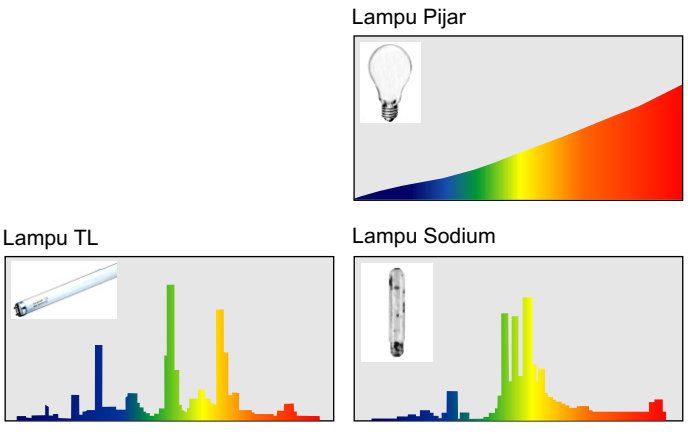


Cahaya putih dilewatkan pada prisma terurai menjadi beberapa warna

Tiap bagian warna yang ada pada sebuah spektrum cahaya memiliki panjang gelombang yang berbeda-beda. Gelombang cahaya yang bisa terlihat oleh mata normal memiliki panjang gelombang berkisar antara 380 – 780 nm. Dimulai dari warna ungu dengan panjang gelombang 380 nm sampai dengan warna merah dengan panjang gelombang 780 nm. Diluar panjang gelombang tersebut kita kenal dengan gelombang tidak tampak, seperti infra merah, ultra violet, sinar x, sinar alpha, sinar gamma, gelombang radio dsb.



Pada sumber cahaya buatan, setiap jenis sumber cahaya memancarkan spektrum cahaya dengan kelengkapan warna yang berbeda-beda. Spektrum cahaya yang dihasilkan lampu pijar kelengkapannya berbeda dengan spektrum cahaya yang dihasilkan lampu sodium, lampu merkuri ataupun lampu metal halida. Perbedaan spektrum warna inilah yang membuat mata manusia mempersepsikan perbedaan berbagai warna cahaya lampu baik itu “putih” ataupun “kuning”.



Spektrum cahaya yang di pancarkan beberapa sumber cahaya buatan

TEMPERATUR WARNA (COLOUR TEMPERATURE / Tc)

Pengaruh warna cahaya pada sebuah ruang ataupun sebaran cahaya dari sumber cahaya sering kita ungkapkan dengan istilah *warm* (hangat) atau *cool* (putih). Tetapi pada dasarnya kita memerlukan sebuah satuan dasar untuk menetapkan atau mengidentifikasikan sebuah warna cahaya. Dasar penetapan satuan ini adalah dengan menggunakan sebuah benda yang disebut *Black Body. Black Body* adalah sebuah benda yang menyerap semua radiasi yang mengenainya, tidak memancarkan dan tidak memantulkannya lagi.

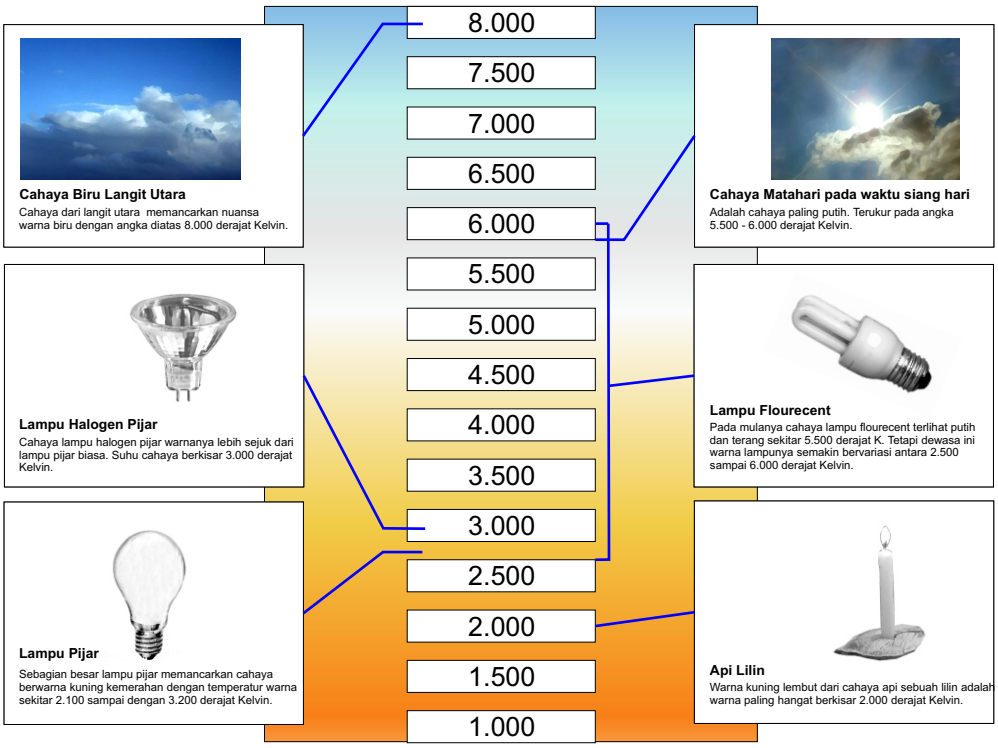
Emisi Cahaya yang dipancarkan benda ini hanya berdasarkan suhu dari benda tersebut. Dengan memanaskan benda ini pada suhu yang ditetapkan (derajat K), *Black Body* akan memancarkan cahaya dengan warna tertentu. Dengan cara inilah nilai dari warna cahaya ditentukan dengan satuan Kelvin (K). Besaran dari warna cahaya ini dikenal juga sebagai *Temperatur Warna* (*Tc*) dengan satuan derjat *Kelvin*.

Satu hal yang menarik adalah bahwa semakin tinggi suhu yang digunakan untuk memanaskan *black body* semakin sejuk warna yang dipancarkan. Dengan demikian Semakin hangat (*warm/merah kekuningan*) warna sebuah cahaya, semakin rendah derajat Kelvin-nya dan semakin sejuk (*cool/putih kebiruan*) warna sebuah cahaya, semakin tinggi derajat Kelvin-nya.



Gbr.3. Perbedaan warna cahaya ditentukan dengan satuan derajat *Kelvin*

Berbagai warna cahaya yang bisa kita lihat baik cahaya yang berasal dari sumber alami maupun sumber cahaya buatan dapat kita lihat pada daftar dibawah ini.



RENDERASI WARNA (COLOUR RENDERING / Ra)

Dalam impresi sebuah ruang seringkali kita rasakan perbedaan yang tercipta akibat perbedaan nuansa cahaya. Sebenarnya hal yang menentukan sebuah impresi tidak hanya berdasarkan warna cahaya yang terpancar di dalam ruang. Ada hal lain yang ditimbulkan cahaya yang menimbulkan sebuah efek tentang bagaimana kita mengapresiasikan ruang beserta berbagai benda di dalamnya. Efek tersebut didasarkan pada bagaimana warna-warna benda yang ada terlihat dengan baik oleh mata kita.

Warna benda akan terlihat berbeda-beda saat kita melihatnya dibawah sorotan cahaya dari sumber cahaya yang berbeda-beda pula. Warna asli kita asumsikan paling nyata adalah ketika kita melihatnya di bawah sorotan cahaya alam yang paling berpengaruh, yaitu cahaya matahari. Warna-warna asli ini kemudian kita persepsikan berbeda ketika terlihat dibawah sorotan sumber cahaya buatan.

Berbagai jenis cahaya buatan yang kita kenal memiliki kemampuan yang berbeda-beda dalam menampilkan warna asli sebuah benda dibandingkan pada saat benda tersebut dilihat dibawah cahaya matahari. Kemampuan inilah yang disebut kemampuan cahaya untuk merenderasi warna benda (Ra).

Kemampuan yang berbeda dalam hal merenderasi warna ini disebabkan oleh perbedaan komposisi & kelengkapan spektrum warna yang dihasilkan setiap sumber cahaya buatan. Spektrum warna Lampu pijar serta lampu halogen seperti halnya spektrum warna cahaya matahari terdiri dari komposisi yang lengkap & menerus. Sementara spektrum warna cahaya lampu lainnya berbeda-beda dalam hal komposisi & kelengkapan warnanya. Hal inilah yang menyebabkan kemampuan renderasi warna setiap sumber cahaya buatan menjadi berbeda.

Untuk memberikan sebuah patokan atau satuan dalam menentukan kemampuan cahaya merenderasi warna, warna benda yang tampil dibawah cahaya sebuah sumber cahaya buatan dibandingkan dengan warna benda tersebut dilihat dibawah sorotan cahaya matahari. Kemudian persentase kesamaan warna yang tampil dijadikan sebagai ukuran. Dengan demikian tampilan warna dibawah cahaya matahari disebut memiliki renderasi 100% atau lebih umum disebut Ra 100. Pemberian skala standar terhadap kemampuan merenderasi warna ini kemudian dilakukan dengan membuat indeks yang disebut *Colour Rendering Index* (*CRI*) dengan skala tertinggi 100.



Gbr.4. Perbedaan *Colour Rendering* cahaya dan pengaruhnya terhadap tampilan warna yang terlihat.

Kemampuan sumber cahaya buatan dalam merenderasi warna digolongkan menjadi: Sangat Baik (Eccellent), Baik (Good), Cukup (Moderate), Kurang (Insufficient) dan buruk (Poor). Tetapi pada umumnya penggolongannya dilakukan menjadi tiga, yaitu:

1. Sangat baik , CRI dengan Ra antara 90 s/d 100
2. Baik, CRI dengan Ra antara 80 s/d 90
3. Cukup sampai kurang, CRI dengan Ra dibawah 80.

Beberapa Sumber cahaya dengan temperatur warna (*Tc*) serta kemampuan renderasi warna (*Ra*) yang berbeda-beda dapat kita lihat pada table berikut:

Sumber Cahaya	*Tc* (K)	*Ra*
Langit Biru	10.000 - 30.000	85 - 100
Langit Berawan	7.000	85 -100
Cahaya Siang (*Daylight*)	6.000	85 -100
Lampu *Discharge* (Kecuali Na)		
Daylight (Halogen)	6.000	96 -100
Neutral White	3.000 - 5.000	70 - 84
Warm White	< 3.000	40 - 69
Lampu *Discharge* Na	2.900	< 40
Lampu Pijar	2.100 - 3.200	85 -100
Lampu Fotografi	3.400	85 -100
Cahaya lilin atau minyak lilin	1.800 - 2.000	40 - 69

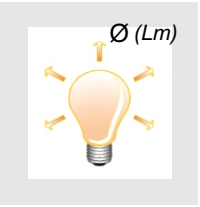
Tabel.1. Beberapa Cahaya dari sumber cahaya dengan Temperatur warna (*Tc*) dan Renderasi warna (*Ra*) yang berbeda.

ISTILAH-ISTILAH PERHITUNGAN DALAM PENCAHAYAAN

Luminous Flux (*Lumen*)

Banyaknya jumlah cahaya yang dikeluarkan sumber cahaya dalam waktu 1 detik, diukur dengan satuan *lumen* (Ø). Setiap sumber cahaya memiliki *Luminous Flux* atau *Lumen-output* yang berbeda-beda & biasa diinformasikan produsen lampu pada kemasa lampu.

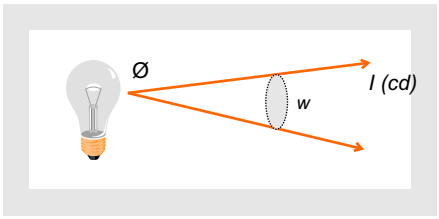
Ø = *lumen output*



Luminous Intensity (*Candela*)

Banyaknya jumlah cahaya yang dikeluarkan sumber cahaya per satu satuan sudut ruang (steradian/w), diukur dengan satuan *candela*. Pada semua jenis lampu yang diproduksi langsung bersama dengan reflektor, satuan *out-put* cahaya yang dicantumkan bukan *lumen* tetapi *candela* karena seluruh cahaya yang dihasilkan lampu tersebut diarahkan pada sudut yang sudah ditetapkan.

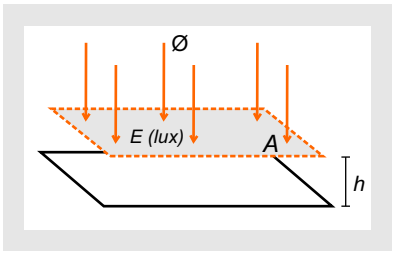
$$I = \frac{Ø}{w}$$



Iluminance (*Lux*)

Banyaknya jumlah cahaya yang jatuh pada sebuah bidang kerja / permukaan dibagi dengan luas area / permukaan tsb. diukur dengan satuan *Lux*. *Horizontal Iluminance* atau Iluminasi horizontal ini menunjukkan tingkat penerangan cahaya dalam sebuah ruangan pada suatu bidang kerja horizontal yang ditetapkan ketinggiannya.

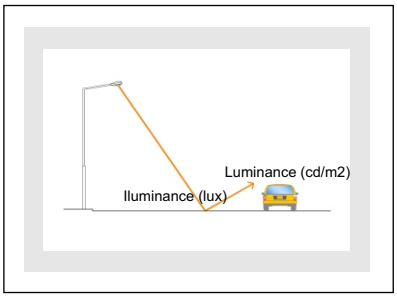
$$E = \frac{Ø \ X \ (Faktor\ Desain)}{A\ (m2)}$$



Luminance (*Candela/m2*)

Banyaknya jumlah cahaya pada permukaan objek yang dapat dilihat oleh mata pengamat (Brightness), diukur dengan satuan *candela / m2.*

$$L = \frac{I}{A}$$



ISTILAH-ISTILAH LAMPU

 **A60**	**A**ll purpose lamp, **60** mm diameter
 **D45**	**D**rop form lamp, 45 mm diameter
 **QPAR16**	**Q**uartz **P**arabolic **A**luminized **R**eflector lamp, **16**/8" diameter
 **PAR20**	**P**arabolic **A**luminized **R**eflector lamp, **20**/8" diameter
 **PAR30**	**P**arabolic **A**luminized **R**eflector lamp, **30**/8" diameter
 **PAR38**	**P**arabolic **A**luminized **R**eflector lamp, **38**/8" diameter
 **QR-CB51**	**Q**uartz **R**eflector lamp - **C**ool **B**eem, **51** mm diameter
 **QR111**	**Q**uartz **R**eflector lamp - **111** mm diameter
QT-DE12	**Q**uartz **T**ubular lamp - **D**ouble **E**nded, **12** mm diameter
QT14	**Q**uartz **T**ubular lamp - **14** mm diameter
 **QT32**	**Q**uartz **T**ubular lamp - **32** mm diameter
 **QT9,QT12**	**Q**uartz **T**ubular lamp - **9** / **12** mm diameter
T5	**T**ubular Flourescent lamp, **5**/8" mm diameter
T8	**T**ubular Flourescent lamp, **8**/8" mm diameter
 **T32-R**	**T**ubular Flourescent lamp - **32**mm diameter, **R**ing shaped
TC	**T**ubular **C**ompact Flourescent lamp

TC-D	**T**ubular **C**ompact Flourescent lamp, two fold (**D**ouble)
 **TC-T**	**T**ubular **C**ompact Flourescent lamp, three fold (**T**riple)
TC-DEL	**T**ubular **C**ompact Flourescent lamp, two fold (**D**ouble)-external **EL**ectronic ballast
 **TC-TEL**	**T**ubular **C**ompact Flourescent lamp, three fold (**T**riple)-external **EL**ectronic ballast
 **TC-TSE**	**T**ubular **C**ompact Flourescent lamp, three fold (**T**riple)-**S**elf **E**lectronic ballast
 **HME**	**H**igh pressure **M**ercury **E**lliptical lamp
 **HSE-I**	**H**igh pressure **S**odium **E**lliptical lamp, built-in **I**gnitor
 **HST-MF**	**H**igh pressure **S**odium **T**ubular lamp - **M**ore luminous **F**lux
HST-DE	**H**igh pressure **S**odium **T**ubular lamp - **D**ouble **E**nded
 **HIE-CE**	**H**igh pressure **I**odide (metal halide) **E**lliptical lamp - **CE**ramic burner
 **HIT-CE**	**H**igh pressure **I**odide (metal halide) **T**ubular lamp - **CE**ramic burner
 **HIT-DE-CE**	**H**igh pressure **I**odide (metal halide) **T**ubular lamp - **D**ouble **E**nded - **CE**ramic burner
 **HIT-TC-CE**	**H**igh pressure **I**odide (metal halide) **T**ubular lamp-**T**ube from **C**ompact - **CE**ramic burner
HIT-CE	**H**igh pressure **I**odide (metal halide), **T**ubular lamp - **CE**ramic burner
 **HIPAR20**	**H**igh pressure **I**odide (metal halide) **P**arabolic **A**luminized **R**eflector lamp - **20**/8"diameter
 **HIPAR-L30**	**H**igh pressure **I**odide (metal halide) **P**arabolic **A**luminized **R**eflector lamp - Long-**30**/8"diameter

LAMP CATALOGUE

SYMBOL	LAMP	WATTAGE	BASE	LUMINIOUS FLUX	LUMINIOUS INTENSITY	Colour Temp. (Kelvin)	Average Life (Hour)	MANUFACTURER PHILIPS	MANUFACTURER OSRAM
INCANDESCENT LAMP									
	A60	15 W	E27	90 lm		2800	1000	CALSSICTONE	CLAS A FR/CL 15
		25 W	E27	220 lm		2800	1000	CALSSICTONE	CLAS A FR/CL 25
		40 W	E27	420 lm		2800	1000	CALSSICTONE	CLAS A FR/CL 40
		60 W	E27	710 lm		2800	1000	CALSSICTONE	CLAS A FR/CL 60
		75 W	E27	940 lm		2800	1000	CALSSICTONE	CLAS A FR/CL 75
		100 W	E27	1360 lm		2800	1000	CALSSICTONE	CLAS A FR/CL 100
	A65	150 W	E27	2160 lm		2800	1000	CALSSICTONE	CLAS A FR/CL 150
	A80	200 W	E27	3040 lm		2800	1000	CALSSICTONE	CLAS A FR/CL 200
	D45	15 W	E14/E27	90 lm		2800	1000	CALSSICTONE	CLASS P FR/CL 15
		25 W	E14/E27	200 lm		2800	1000	CALSSICTONE	CLASS P FR/CL 25
		40 W	E14/E27	400 lm		2800	1000	CALSSICTONE	CLASS P FR/CL 40
		60 W	E14/E27	660 lm		2800	1000	CALSSICTONE	CLASS P FR/CL 60
	T60	25 W	E27	195 lm		2800	1000	SOFTONE	BELLA T60 SIL 25
		40 W	E27	370 lm		2800	1000	SOFTONE	BELLA T60 SIL 40
		60 W	E27	630 lm		2800	1000	SOFTONE	BELLA T60 SIL 60
		75 W	E27	840 lm		2800	1000	SOFTONE	BELLA T60 SIL 75
		100 W	E27	1200 lm		2800	1000	SOFTONE	BELLA T60 SIL 100
INCANDESCENT REFLECTOR LAMP									
	R50	25 W	E14		220 cd	2800	1000	SPOTONE	CONC R50 25
		40 W	E14		430 cd	2800	1000	SPOTONE	CONC R50 40
	R63	25 W	E27		290 cd	2800	1000	SPOTONE	CONC R63 25
		40 W	E27		540 cd	2800	1000	SPOTONE	CONC R63 40
		60 W	E27		960 cd	2800	1000	SPOTONE	CONC R63 60
	R80	40 W	E27		150 cd	2800	1000	SPOTONE	CONC R80 40
		60 W	E27		260 cd	2800	1000	SPOTONE	CONC R80 60
		75 W	E27		345 cd	2800	1000	SPOTONE	CONC R80 75
		100 W	E27		500 cd	2800	1000	SPOTONE	CONC R80 100
	R95	75 W	E27		1000 cd	2800	1000	SPOTONE	CONC R95 75
		100 W	E27		1350 cd	2800	1000	SPOTONE	CONC R95 100
		150 W	E27		2250 cd	2800	1000	SPOTONE	CONC R95 150
	PAR38	60 W - 12	E27		3400 cd	2800	2000	-	CONCENTRA PAR38
		60 W - 30	E27		1200 cd	2800	2000	-	CONCENTRA PAR38
		80 W - 12	E27		5400 cd	2800	2000	PAR38 ECONOMY	CONCENTRA PAR38
		80 W - 30	E27		1800 cd	2800	2000	PAR38 ECONOMY	CONCENTRA PAR38
		120 W - 10	E27		-	-	2000	PAR38 ECONOMY	
		120 W - 12	E27		9300 cd	2800	2000	-	CONCENTRA PAR38
		120 W - 30	E27		3100 cd	2800	2000	PAR38 ECONOMY	CONCENTRA PAR38
LOW VOLTAGE TUNGSTEN HALOGEN LAMP									
	QT9	5 W	G4	60 lm		3000	4000	Capsuleline	HALOSTAR STARLITE
		10 W	G4	130 lm		3000	4000	Capsuleline	HALOSTAR STARLITE
		20 W	G4	320 lm		3000	4000	Capsuleline	HALOSTAR STARLITE
	QT12	35 W	GY6.35	600 lm		3000	4000	Capsuleline	HALOSTAR STARLITE
		50 W	GY6.35	910 lm		3000	4000	Capsuleline	HALOSTAR STARLITE
		75 W	GY6.35	1450 lm		3000	4000	Capsuleline	HALOSTAR STARLITE
		90 W	GY6.35	1800 lm		3000	4000	-	HALOSTAR STARLITE
		100 W	GY6.35	2550 lm		3000	4000	Capsuleline	-
MAIN VOLTAGE TUNGSTEN HALOGEN LAMP									
	QT14	25 W	G9	260 lm		2900	2000	Clickline MV Capsule	HALOPIN
		40 W	G9	490 lm		2900	2000	Clickline MV Capsule	HALOPIN
		60 W	G9	820 lm		2900	2000	Clickline MV Capsule	HALOPIN
		75 W	G9	1100 lm		2900	2000	-	HALOPIN
	QT32	60 W	E27	820 lm		2900	2000	HalogenA Pro	HALOLUX CERAM
		75 W	E27	1100 lm		2900	2000		HALOLUX CERAM
		100 W	E27	1500 lm		2900	2000	HalogenA Pro	HALOLUX CERAM
		150 W	E27	2500 lm		2900	2000	HalogenA Pro	HALOLUX CERAM
		250 W	E27	4350 lm		2900	2000		HALOLUX CERAM
	QT-DE12	60 W	R7s	828 - 840 lm		3000	2000	PlusLine Pro Compact	HALOLINE
		100 W	R7s	1550 - 1600 lm		3000	2000	PlusLine Pro Compact	HALOLINE
		150 W	R7s	2500 - 2550 lm		3000	2000	PlusLine Pro Compact / Pro Small	HALOLINE
		200 W	R7s	3200 - 3500 lm		3000	2000	PlusLine Pro Compact / Pro Small	HALOLINE
		300 W	R7s	5300 lm		3000	2000	PlusLine Pro Compact	HALOLINE
		500 W	R7s	9500 lm		3000	2000	PlusLine Pro Compact	HALOLINE
LOW VOLTAGE TUNGSTEN HALOGEN REFLECTOR LAMP									
	QR-CBC35	20 W - 10	GU4		3200 - 4800 cd	2900 - 3000	2000 - 4000	BRILIANTline Pro	DECOSTAR 35/TITAN
		20 W - 30	GU4		690 cd		4000	BRILIANTline Pro	-
		20 W - 38	GU4		500 - 700 cd	2900 - 3000	2000 - 4000	-	DECOSTAR 35/TITAN
		35 W - 10	GU4		5400 - 7000 cd	2900 - 3000	4000	BRILIANTline Pro	DECOSTAR 35/TITAN
		35 W - 30	GU4		1300 cd	2900 - 3000	4000	BRILIANTline Pro	-
		35 W - 38	GU4		900 - 1350 cd	2900 - 3000	2000 - 4000	-	DECOSTAR 35/TITAN
	QR-CBC51	20 W - 10	GU5.3		5000 - 6000 cd	3000	4000	BRILIANTline Pro	DECOSTAR 51 IRC/TITAN
		20 W - 24	GU5.3		1800 - 2300 cd	3000	4000	BRILIANTline Pro	DECOSTAR 51 IRC/TITAN
		20 W - 30	GU5.3		780 cd	3000	4000	BRILIANTline Pro	-
		20 W - 36	GU5.3		780 cd	3000	4000	BRILIANTline Pro	-
		20 W - 38	GU5.3		780 - 1000 cd	3000	4000	-	DECOSTAR 51 IRC/TITAN
		20 W - 60	GU5.3		350 - 450 cd	3000	4000	BRILIANTline Pro	DECOSTAR 51 IRC/TITAN
		35 W - 10	GU5.3		8000 - 12500 cd	3000	4000	BRILIANTline Pro	DECOSTAR 51 IRC/TITAN
		35 W - 24	GU5.3		3100 - 4400 cd	3000	4000	BRILIANTline Pro	DECOSTAR 51 IRC/TITAN
		35 W - 36	GU5.3		1500 cd	3000	4000	BRILIANTline Pro	-
		35 W - 38	GU5.3		1500 - 2200 cd	3000	4000	-	DECOSTAR 51 IRC/TITAN
		35 W - 60	GU5.3		700 - 1100 cd	3000	4000	BRILIANTline Pro	DECOSTAR 51 IRC/TITAN
		50 W - 10	GU5.3		12500 - 15000 cd	3000	4000	-	DECOSTAR 51 IRC/TITAN
		50 W - 24	GU5.3		4400 - 5500 cd	3000	4000	BRILIANTline Pro	DECOSTAR 51 IRC/TITAN
		50 W - 36	GU5.3		2200 cd	3000	4000	BRILIANTline Pro	-
		50 W - 38	GU5.3		1500 cd	3000	4000	-	DECOSTAR 51 IRC/TITAN
		50 W - 60	GU5.3		1100 - 1430 cd	3000	4000	BRILIANTline Pro	DECOSTAR 51 IRC/TITAN
	QR111	35 W - 4	G53		35000 cd	3000	3000	-	HALOSPOT 111
		35 W - 24	G53		2500 cd	3000	3000	-	HALOSPOT 111
		50 W - 4	G53		40000 cd	3000	3000	-	HALOSPOT 111
		50 W - 8	G53		20000 - 23000 cd	3000	3000	ALUline Pro 111	HALOSPOT 111
		50 W - 24	G53		4000 cd	3000	3000	ALUline Pro 111	HALOSPOT 111
		75 W - 8	G53		30000 cd	3000	3000	ALUline Pro 111	HALOSPOT 111
		75 W - 24	G53		5300 cd	3000	3000	ALUline Pro 111	HALOSPOT 111
		75 W - 45	G53		2000 cd	3000	3000	ALUline Pro 111	HALOSPOT 111
		100 W - 8	G53		48000 cd	3000	3000	ALUline Pro 111	HALOSPOT 111
		100 W - 24	G53		8500 cd	3000	3000	ALUline Pro 111	HALOSPOT 111
		100 W - 45	G53		2800 cd	3000	3000	ALUline Pro 111	HALOSPOT 111

SYMBOL	LAMP	WATTAGE	BASE	LUMINIOUS FLUX	LUMINIOUS INTENSITY	Colour Temp. (Kelvin)	Average Life (Hour)	MANUFACTURER PHILIPS	MANUFACTURER OSRAM
MAIN VOLTAGE TUNGSTEN HALOGEN REFLECTOR LAMP									
	QPAR16	35 W - 35	GU10		600 cd	2900	2000	-	HALOPAR16 Alu
		40 W - 35	GU10		550 cd	2900	2000	TWISTline	-
		40 W - 50	GU10		350 cd	2900	2000	TWISTline	-
		50 W - 25	GU10/GZ10			2900	2000	TWISTline Alu/Dichro	-
		50 W - 35	GU10/GZ10		900 - 950 cd	2900	2000	-	HALOPAR16 Alu/Dichro
		50 W - 50	GU10/GZ10		500 - 600 cd	2900	2000	TWISTline Alu/Dichro	-
		40 W - 25	E14		950 cd	2900	2000	PAR 16 Halogen A	-
		40 W - 35	E14		650 cd	2900	2000	-	HALOPAR16 Alu
	PAR20	50 W - 10	E27		3000 - 3200 cd	2900	2000	PAR20 Halogen A Pro	HALOPAR20 Alu/Dichro
		50 W - 25	E27		850 cd	2900	2000	PAR20 Halogen A Pro	-
		50 W - 30	E27		1000 - 1100 cd	2900	2000	-	HALOPAR20 Alu/Dichro
		75 W - 30	GU10		1900 cd	2900	2000	-	HALOPAR20 Alu
	PAR30	75 W - 10	E27		5525 - 7500 cd	2900	2000	PAR30S Halogen A Pro	HALOPAR30 Alu/Dichro
		75 W - 30	E27		1700 - 2400 cd	2900	2000	PAR30S Halogen A Pro	HALOPAR30 Alu/Dichro
		100 W - 10	E27		9000 cd	2900	2500	PAR30S Halogen A Pro	-
		100 W - 30	E27		3000 cd	2900	2500	PAR30S Halogen A Pro	-
	PAR38	75 W - 10	E27		7800 cd	2900	2000	PAR38 Halogen A	-
		75 W - 30	E27		1870 cd	2900	2000	PAR38 Halogen A	-
		100 W - 10	E27		8500 cd	2900	2000	PAR38 Halogen A	-
		100 W - 30			2550 cd	2900	2000	PAR38 Halogen A	-
LINIER FLOURESCENT LAMP									
	T5(T16)	14 W	G5	1100 - 1200 lm		2700 - 6500	20000	MASTER TL-5 HE	LUMILUX T5 HE
		21 W	G5	1750 - 1900 lm		2700 - 6500	20000	MASTER TL-5 HE	LUMILUX T5 HE
		24 W	G5	1600 - 1750 lm		2700 - 6500	20000	MASTER TL-5 HO	LUMILUX T5 HO
		28 W	G5	2400 - 2600 lm		2700 - 6500	20000	MASTER TL-5 HE	LUMILUX T5 HE
		35 W	G5	3050 - 3300 lm		2700 - 6500	20000	MASTER TL-5 HE	LUMILUX T5 HE
		39 W	G5	2850 - 3100 lm		2700 - 6500	20000	MASTER TL-5 HO	LUMILUX T5 HO
		49 W	G5	4100 - 4300 lm		2700 - 6500	20000	MASTER TL-5 HO	LUMILUX T5 HO
		54 W	G5	4050 - 4450 lm		2700 - 6500	20000	MASTER TL-5 HO	LUMILUX T5 HO
		80 W	G5	5700 - 6150 lm		3000 - 6500	20000	MASTER TL-5 HO	LUMILUX T5 HO
	T8(T26)	10 W	G13	650 lm		2700	16000	-	LUMILUX T8
		15 W	G13	950 - 1000 lm		2700 - 4000	16000	MASTER TL-D Super 80	LUMILUX T8
		16 W	G13	1250 lm		2700 - 4000	16000	-	LUMILUX T8
		18 W	G13	1300 - 1350 lm		2700 - 6500	16000	MASTER TL-D Super 80	LUMILUX T8
		23 W	G13	2050 lm		3000 - 4000	16000	MASTER TL-D Super 80	-
		30 W	G13	2300 - 2400 lm		2700 - 6500	16000	MASTER TL-D Super 80	LUMILUX T8
		36 W	G13	3100 - 3350 lm		2700 - 6500	16000	MASTER TL-D Super 80	LUMILUX T8
		38 W	G13	3300 - 3350 lm		3000 - 4000	16000	MASTER TL-D Super 80	LUMILUX T8
		58 W	G13	5000 - 5200 lm		2700 - 6500	16000	MASTER TL-D Super 80	LUMILUX T8
CIRCULAR FLOURESCENT LAMP									
	T16-R	22 W	2GX13	1700 - 1800 lm		2700 - 6500		TL5 Circular Super 80 Pro	LUMILUX T5 CIRCLINE
		40 W	2GX13	3000 - 3300 lm		2700 - 6500		TL5 Circular Super 80 Pro	LUMILUX T5 CIRCLINE
		55 W	2GX13	3800 - 4200 lm		2700 - 6500		TL5 Circular Super 80 Pro	LUMILUX T5 CIRCLINE
		60 W	2GX13	5000 lm		3000 - 4000		TL5 Circular Super 80 Pro	-
	T32-R	22 W	G10q	1050 - 1350 lm		2700 - 6200	8000	TL-E Standard	LUMILUX CIRCULAR
		32 W	G10q	1800 lm		2700 - 6200		TL-E Standard	LUMILUX CIRCULAR
		40 W	G10q	2500 - 2950 lm		2700 - 6200		TL-E Standard	LUMILUX CIRCULAR
COMPACT FLOURESCENT LAMP									
	TC	5 W	G23	250 lm		2700 - 4000	10000	MASTER PL-S 2 Pin	DULUX S
		7 W	G23	370 - 400 lm		2700 - 6000	10000	MASTER PL-S 2 Pin	DULUX S
		9 W	G23	565 - 600 lm		2700 - 6000	10000	MASTER PL-S 2 Pin	DULUX S
		11 W	G23	850 - 900 lm		2700 - 6000	10000	MASTER PL-S 2 Pin	DULUX S
	TC-EL	5 W	2G7	250 lm		2700 - 4000	8000	MASTER PL-S 4 Pin	DULUX S/E
		7 W	2G7	400 lm		2700 - 4000	8000	MASTER PL-S 4 Pin	DULUX S/E
		9 W	2G7	600 lm		2700 - 4000	8000	MASTER PL-S 4 Pin	DULUX S/E
		11 W	2G7	900 lm		2700 - 4000	8000	MASTER PL-S 4 Pin	DULUX S/E
	TC-D	10 W	G24d-1	600 lm		2700 - 4000	8000	MASTER PL-C 2 Pin	DULUX D
		13 W	G24d-1	900 lm		2700 - 4000	8000	MASTER PL-C 2 Pin	DULUX D
		18 W	G24d-2	1200 lm		2700 - 4000	8000	MASTER PL-C 2 Pin	DULUX D
		26 W	G24d-3	1800 lm		2700 - 4000	8000	MASTER PL-C 2 Pin	DULUX C
	TC-DEL	10 W	G24q-1	600 lm		2700 - 4000	8000	MASTER PL-C 4 Pin	DULUX D/E
		13 W	G24q-1	900 lm		2700 - 6500	8000	MASTER PL-C 4 Pin	DULUX D/E
		18 W	G24q-2	1200 lm		2700 - 6500	8000	MASTER PL-C 4 Pin	DULUX D/E
		26 W	G24q-3	1800 lm		2700 - 6500	8000	MASTER PL-C 4 Pin	DULUX D/E
	TC-T	13 W	GX24d-1	900 lm		2700 - 4000		MASTER PL-T 2 Pin	DULUX T PLUS
		18 W	GX24d-2	1200 lm		2700 - 4000		MASTER PL-T 2 Pin	DULUX T PLUS
		26 W	GX24d-3	1800 lm		2700 - 4000		MASTER PL-T 2 Pin	DULUX T PLUS
	TC-TEL	13 W	GX24q-1	900 lm		2700 - 4000		MASTER PL-T 4 Pin	DULUX T/E PLUS
		18 W	GX24q-2	1200 lm		2700 - 4000		MASTER PL-T 4 Pin	DULUX T/E PLUS - IN PLUS
		26 W	GX24q-3	1800 lm		2700 - 4000		MASTER PL-T 4 Pin	DULUX T/E PLUS - IN PLUS
		32 W	GX24q-3	2400 lm		2700 - 4000		MASTER PL-T 4 Pin	DULUX T/E PLUS - IN PLUS
		42 W	GX24q-4	3200 lm		2700 - 4000		MASTER PL-T 4 Pin	DULUX T/E PLUS - IN PLUS
		57 W	GX24q-5	4300 lm		2700 - 4000		MASTER PL-T 4 Pin	DULUX T/E PLUS - IN PLUS
		70 W	GX24q-5	5200 lm		3000 - 4000		-	DULUX T/E PLUS - IN PLUS
	TC-L	18 W	2G11	750 - 1200 lm		2700 - 6500	12000	MASTER PL-L 4 Pin	DULUX L LUMILUX DE LUXE / LUMILUX
		24 W	2G11	1200 - 1800 lm		2700 - 6500	10000	MASTER PL-L 4 Pin	DULUX L LUMILUX DE LUXE / LUMILUX
		36 W	2G11	1900 - 2900 lm		2700 - 6500	10000	MASTER PL-L 4 Pin	DULUX L LUMILUX DE LUXE / LUMILUX
		40 W	2G11	2200 - 3500 lm		2700 - 6000		MASTER PL-L 4 Pin	DULUX L LUMILUX DE LUXE / LUMILUX
		55 W	2G11	3000 - 4800 lm		2700 - 6500		MASTER PL-L 4 Pin	DULUX L LUMILUX DE LUXE / LUMILUX
		80 W	2G11	6000 lm		2700 - 4000		MASTER PL-L 4 Pin	DULUX L LUMILUX
E27 COMPACT FLOURESCENT LAMP (BUILT-IN ELECTRONIC BALLAST)									
	TC-SE	3 W	E14	100 lm		2700		-	DULUX EL Longlife E14/E27
	TC-DSE	5 W	E14/E27	240 lm		2700		GENIE (E14)	DULUX EL Longlife E14/E27
		7 W	E14/E27	400 lm		2700		-	DULUX EL Longlife E14/E27
		8 W	E27			2700 & 6500		ESSENTIAL	-
		14 W	E27			2700 & 6500		ESSENTIAL	-
		23 W	E27			2700 & 6500		ESSENTIAL	-
	TC-TSE	8 W	E27					GENIE	-
		11 W	E14/E27	630 lm		2700		GENIE (E27)	DULUX EL Longlife E14/E27
		14 W	E27					GENIE	-
		15 W	E27	900 lm		2700		-	DULUX EL Longlife E27
		18 W	E27			2700 & 6500			-
		23 W	E27	1500 lm		2700		-	DULUX EL Longlife E27
	TC-QSE	30 W	E27	1900 lm		2700		-	DULUX EL Longlife E27
MERCURY VAPOUR LAMP									
	HME	50 W	E27	1600 - 2000 lm		3000 - 4200	20000	HPL Comfort Pro/HPL-N	HQL Standard/Super De Luxe/De Luxe
		80 W	E27	3400 - 4300 lm		3000 - 4200	20000	HPL Comfort Pro/HPL-N	HQL Standard/Super De Luxe/De Luxe
		125 W	E27	5700 - 6500 lm		3000 - 4200	20000	HPL Comfort Pro/HPL-N	HQL Standard/Super De Luxe/De Luxe
		250 W	E40	12700 - 14000 lm		3400 - 4100	16000	HPL Comfort Pro/HPL-N	HQL Standard/De Luxe
		400 W	E40	22000 - 24000 lm		3400 - 4000	16000	HPL Comfort Pro/HPL-N	HQL Standard/De Luxe
		700 W	E40	38500 - 42000 lm		3550 - 3900	12000	HPL-N	HQL Standard
		1000 W	E40	57000 - 58500 lm		3550 - 3900	-	HPL-N	HQL Standard

SYMBOL	LAMP	WATTAGE	BASE	LUMINIOUS FLUX	LUMINIOUS INTENSITY	Colour Temp. (Kelvin)	Average Life (Hour)	MANUFACTURER PHILIPS	MANUFACTURER OSRAM
HIGH PRESSURE SODIUM LAMP									
	HSE	50 W	E27	3500 lm		2000	24000	SON PRO (SON-E)	VIALOX NAV-E/NAV-E 4Y
		70 W	E27	5600 lm		2000	24000	SON PRO (SON-E)	VIALOX NAV-E/NAV-E 4Y
		100 W	E40	8500 lm		2000	24000	SON PRO (SON-E)	-
		150 W	E40	14000 - 14500 lm		2000	24000	SON PRO (SON-E)	VIALOX NAV-E/NAV-E 4Y
		250 W	E40	25000 - 27000 lm		2000	24000	SON PRO (SON-E)	VIALOX NAV-E/NAV-E 4Y
		400 W	E40	47000 - 48000 lm		2000	24000	SON PRO (SON-E)	VIALOX NAV-E/NAV-E 4Y
		1000 W	E40	120000 - 130000 lm		2000	24000	SON PRO (SON-E)	VIALOX NAV
	HSE-I	50 W	E27	34000 - 3500 lm		2000	24000	SON PRO (SON-I)	VIALOX NAV-E/NAV-E 4Y
		70 W	E27	5600 - 6000 lm		2000	24000	SON PRO (SON-I)	VIALOX NAV-E/NAV-E 4Y
	HSE-MF	100 W	E40	9500 - 10200 lm		2000	-	MASTER SON PIA plus	VIALOX NAV-E SUPER 4Y
		150 W	E40	16700 - 17000 lm		2000	-	MASTER SON PIA plus	VIALOX NAV-E SUPER 4Y
		250 W	E40	31000 - 31100 lm		2000	-	MASTER SON PIA plus	VIALOX NAV-E SUPER 4Y
		400 W	E40	54000 - 55500 lm		2000	-	MASTER SON PIA plus	VIALOX NAV-E SUPER 4Y
	HST	70 W	E27	5900 - 6000 lm		2000	24000	SON-T PRO	VIALOX NAV-T/NAV-T 4Y
		100 W	E40	9000 lm		2000	24000	SON-T PRO	-
		150 W	E40	14500 - 15000 lm		2000	24000	SON-T PRO	VIALOX NAV-T/NAV-T 4Y
		250 W	E40	27000 - 28000 lm		2000	24000	SON-T PRO	VIALOX NAV-T/NAV-T 4Y
		400 W	E40	48000 lm		2000	24000	SON-T PRO	VIALOX NAV-T/NAV-T 4Y
		1000 W	E40	130000 lm		2000	15000	SON-T PRO	VIALOX NAV-T/NAV-T 4Y
	HST-MF	50 W	E27	4400 lm		2000	32000	SON-T PIA plus	VIALOX NAV-T SUPER 4Y
		70 W	E27	6500 - 6600 lm		2000	32000	SON-T PIA plus	VIALOX NAV-T SUPER 4Y
		100 W	E40	10000 - 10700 lm		2000	32000	SON-T PIA plus	VIALOX NAV-T SUPER 4Y
		150 W	E40	17200 - 17500 lm		2000	32000	SON-T PIA plus	VIALOX NAV-T SUPER 4Y
		250 W	E40	33000 - 33200 lm		2000	32000	SON-T PIA plus	VIALOX NAV-T SUPER 4Y
		400 W	E40	55000 - 56500 lm		2000	32000	SON-T PIA plus	VIALOX NAV-T SUPER 4Y
		600 W	E40	89000 - 90000 lm		2000	32000	SON-T PIA plus	VIALOX NAV-T SUPER 4Y
	HST-DE	70 W	RX7s	6800 lm		2000		-	VIALOX NAV-TS SUPER 4Y
		150 W	RX7s-24	15000 lm		2000		-	VIALOX NAV-TS SUPER 4Y
		250 W	Fc2	25500 lm		2000		-	VIALOX NAV-TS Standard
		400 W	Fc2	48000 lm		2000		-	VIALOX NAV-TS Standard
METAL HALIDE LAMP									
	HIE	70 W	E27	4700 - 5200 lm		3100 - 4000		-	HQI-E (Coated / Clear)
		100 W	E27	7300 - 8500 lm		2900 - 4000		-	HQI-E (Coated / Clear)
		150 W	E27	10500 - 12000 lm		2900 - 4000		-	HQI-E (Coated / Clear)
		250 W	E40	17000 - 19000 lm		4300 - 6700	20000	HPI-P Plus (Coated)	HQI-E (Coated / Clear)
		400 W	E40	30000 - 40000 lm		4000 - 6700	20000	HPI-P Plus (Coated)	HQI-E (Coated / Clear)
		1000 W	E40	100000 lm		3750		-	HQI-E (Coated / Clear)
	HIE-CE	70 W	E27	5200 - 6000 lm		3000 - 4200		CDM-ET/CDM-EP (Coated/clear)	HCI-E / P (Coated / Clear)
		100 W	E27	7500 - 8500 lm		3000 - 4000		CDM-EP (Coated/clear)	HCI-E / P (Coated / Clear)
		150 W	E27	12000 - 13500 lm		3000 - 4200		CDM-ET/CDM-EP (Coated/clear)	HCI-E / P (Coated / Clear)
		250 W	E40	24500 lm		3000		-	HCI-E (Coated)
	HIT	70 W	G12	5200 - 5500 lm		3000 - 4200		-	HQI-T Powerstar
		150 W	G12	13000 lm		3000 - 4200		-	HQI-T Powerstar
		250 W	E40	19000 - 20000 lm		4500 - 5300	20000	HPI-T Plus	HQI-T Powerstar
		400 W	E40	35000 - 42000 lm		3500 - 6100	20000	HPI-T Plus	HQI-T Powerstar
		1000 W	E40	80000 - 85000 lm		4300 - 6000	10000	HPI-T Pro	HQI-T Powerstar
		2000 W	E40	180000 - 240000 lm		3800 - 6000	10000	HPI-T Pro	HQI-T Powerstar
	HIT-CE	35 W	G12	3100 - 3300 lm		3000 - 4200	12000	CDM-T	HCI-T Powerball
		70 W	G12	6500 - 6700 lm		3000 - 4200	12000	CDM-T	HCI-T Powerball
		150 W	G12	12700 - 14500 lm		3000 - 4200	6000 - 12000	CDM-T	HCI-T Powerball
		250 W	E40	25800 lm		3000		-	HCI-T Powerball
	HIT-CE	70 W	E27	6300 - 6500 lm		3000	12000	CDM-TT	HCI-TT Powerball
		150 W	E40	13500 - 14500 lm		3000	12000	CDM-TT	HCI-TT Powerball
		250 W	E40	21500 lm		4000		CDM-TT	-
		400 W	E40	36000 lm		4000		CDM-TT	-
	HIT-TC-CE	35 W	G85	3100 - 3300 lm		3000 - 4200		CDM-TC	HCI-TC Powerball
		70 W	G85	6400 - 6600 lm		3000 - 4200		CDM-TC	HCI-TC Powerball
	HIT-DE	70 W	RX7s	5000 - 6200 lm		3000 - 5200		MHN-TD/MHW-TD Pro	HQI-TS Powerstar
		150 W	RX7s-24	11000 - 13800 lm		3000 - 5200		MHN-TD/MHW-TD Pro	HQI-TS Powerstar
		250 W	Fc2	20000 - 22000 lm		3200 - 51000		MHN-TD/MHW-TD Pro	HQI-TS Powerstar
		400 W	Fc2	31000 - 37000 lm		4200 - 5600		-	HQI-TS Powerstar
		1000 W	Cable	90000 - 100000 lm		4200 - 5600		MHN-LA	HQI-TS Powerstar
		1800 W	X830R/(P)SFC	155000 - 170000 lm		5600		MHN-SA	-
		1950 W	Cable	200000 lm		5800		-	HQI-TS Powerstar
		2000 W	Cable/X830R	190000 - 220000 lm		4200 - 56000		MHN-LA/MHN-SA	-
		2100 W	Cable	200000 - 225000 lm		4100 - 4700		-	HQI-TS Powerstar
	HIT-DE-CE	70 W	RX7s	6000 - 6600 lm		3000 - 4200	15000	CDM-TD	HCI-TS Powerball
		150 W	RX7s-24	13250 - 14800 lm		3000 - 4200	6000 - 15000	CDM-TD	HCI-TS Powerball
		250 W	Fc2	245000 lm		3000	-	CDM-TD	HCI-TS Powerball
METAL HALIDE REFLECTOR LAMP									
	HIPAR 20	35 W - 10	E27	21500 - 23000 lm		3000 - 4200	7500	CDM-R	HCI-PAR
		35 W - 30	E27	5000 lm		3000 - 4200	7500	CDM-R	HCI-PAR
	HIPAR 30	35 W - 10	E27	37000 - 44000 lm		3000	7500	CDM-R	HCI-PAR
		35 W - 30	E27	7000 - 7400 lm		3000	7500	CDM-R	HCI-PAR
		70 W - 10	E27	55000 - 68000 lm		3000 - 4200	9000	CDM-R	HCI-PAR
		70 W - 30	E27	10000 - 13500 lm		3000 - 4200	9000	CDM-R	HCI-PAR
		70 W - 40	E27	9000 - 10000 lm		3000 - 4200	9000	CDM-R	HCI-PAR

Classification of luminaires according to working conditions (IP Rating)

First characteristic numeral	Brief description	Symbol
0	Non-protected	No symbol
1	Protected against solid objects greater than 50 mm	No symbol
2	Protected against solid objects greater than 12.5 mm	No symbol
3	Protected against solid objects greater than 2.5 mm	No symbol
4	Protected against solid objects greater than 1 mm	No symbol
5	Dust - protected	
6	Dust tight	

Second characteristic numeral	Brief description	Symbol
0	Non-protected	No symbol
1	Protected against dripping water	
2	Protected against dripping water when tilted up to 15 degree	No symbol
3	Protected against spraying water	
4	Protected against splashing water	
5	Protected against water jets	
6	Protected against heavy seas	No symbol
7	Protected against the effects of immersion	
8	Protected against submersion	 --m



Lighting Catalog

Lamp Specification Guide 2013

PHILIPS

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A Commitment to Excellence

For over 120 years, Philips has led the lighting industry, introducing innovative, energy-efficient lighting solutions and building a trusted reputation for exceptional performance and reliability. As the industry continues to transform, so do we to meet the changing needs of our customers.

We've streamlined our organization to enhance our customer experience, providing seamless service, while continuing to drive innovation with a complete portfolio of best-in-class products that represent the full depth, breadth and forward thinking that you can expect from an industry leader.



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Transforming conventional light sources to LED can improve ambiance and energy efficiency and reduce maintenance.

Making possible uses where before it just didn't seem practical

Suited for accent, hard-to-maintain areas and around-the-clock operations, Philips LED retrofit lamps are a simple replacement for existing inefficient technology, reducing installation cost and complexity.

Philips LED retrofit lamps address key issues of heat management and overall lifespan. Designed for superb color consistency and sharp optics, LED lamps are ideal for close-range and general accent lighting. With no harmful UV radiation and virtually no heat, LEDs won't fade colors and avoid inventory spoilage.

The LED 800 Series retrofit lamps offer smooth dimming✤ and improved lumens for more 'punch' where you need it.

AirFlux Technology is an enhanced thermal technology that uses convection and conduction to dissipate heat, while maintaining first-in-class performance.

Current Product	Philips Upgrade Product	Benefit	Page
60W A19 Incandescent (450 lumens)	Philips LED A19	• Smooth dimming to 10% of full light levels✤ • Up to 25,000 hours rated average life • 3-year limited warranty	6
90W PAR38 Halogen	Philips LED 13W PAR38 with Airflux Technology	• Smooth dimming to 10% of full light levels✤ • Improved lumens • Increased candela	9
50W Halogen	Philips LED 10W MR16	• Active cooling • Improved lumens • Increased transformer compatibility	7

✤ Dimmable when using leading edge dimmers. See Philips Website (www.philips.com/ledtechguide) for compatible leading edge dimmers.

LED Lamps

LED A-Type and Candle Lamps

Watts	Bulb Type	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Description	Case Qty.	Rated Avg. Life (Hrs.) (501,502)	Approx. MBCP	CRI	MOL (In.)	Approx. Lumens (503)	Life (Yrs.) (446)	Energy Cost (445)	Color Temp. (K)
													FTC REQUIREMENTS¥			
LED A-Type Lamps																
7	A-Type	Med	42348-3	■	8A19/END/2700 DIM 6/1	120	A19 Dim✤	6	25,000	—	81	4	470	22.8	$0.84	2700
11	A-Type	Med	42349-1	■	11A19/END/2700 DIM 6/1	120	A19 Dim✤	6	25,000	—	81	4	830	22.8	$1.32	2700
10.5	A-Type	Med	43051-2	■	10.5A19/COREPRO/3000 6/1	120	A19 Dim✤	6	25,000	—	81	4	800	22.8	$1.26	2700
15	A-Type	Med	42875-5	■	15A21/2700 DIM 6/1	120	A21 Dim✤	6	25,000	—	80	4⅝	1180	22.8	$1.81	2700
	A-Type	Med	43218-7	■	15A21/2700-WHT DIM 6/1	120	A21 Dim✤	6	25,000	—	80	4½	1180	22.8	$1.81	2700
19	A-Type	Med	43221-1	■	19A21/2700-WHT DIM 6/1	120	A21 Dim✤	6	25,000	—	80	4½	1780	22.8	$2.65	2700
22	A-Type	Med	42352-5	■	22A21/END/2700 DIM	120	A21 Dim✤	6	25,000	—	80	4⅝	1780	22.8	$2.65	2700
LED Candle Lamps																
3.5	BA11	Cand.	42778-1		3.5BA11/END/2700-E12 DIM 8/1	120	BA11 Clear Candle Dim✤	8	25,000	—	80	4	180	22.8	$0.42	2700
	B11	Cand.	42779-9		3.5B11/END/2700-E12 DIM 8/1	120	B11 Candle Dim✤	8	25,000	—	80	4	180	22.8	$0.42	2700
	B12	Cand.	42781-5		3.5B12/END/2700-E12 DIM 8/1	120	B12 Candle Dim✤	8	25,000	—	80	4⅛	180	22.8	$0.42	2700
	F15	Med.	42780-7		3.5F15/END/2700-E12 DIM 8/1	120	F15 Clear Postlight Dim✤	8	25,000	—	80	4⅜	180	22.8	$0.42	2700
4	F15	Med.	42935-7		4.5F15/END/2700-150 E26 DIM 10/1	120	F15 Frosted Postlight Dim✤	8	25,000	—	80	4⅜	320	22.8	$0.54	2700

For the most current product information, go to the e-catalog on **www.philips.com**

LED symbols and footnotes located on page 13



Watts	Bulb Type	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Description	Case Qty.	Rated Avg. Life (Hrs.) (501,502)	Approx. MBCP	CRI	MOL (In.)	Approx. Lumens (503)	Life (Yrs.) (446)	Energy Cost (445)	Color Temp. (K)
LED MR16 Lamps															FTC REQUIREMENTS*	
5.5	MR16	GU5.3	42039-8	■	5MR16/END/F24 2700 12V	12	MR16 Flood 24°	10	25,000	1200	85	1⅝	290	41.1	$0.60	2700
			42038-0	■	5MR16/END/F24 3000 12V	12	MR16 Flood 24°	10	25,000	1250	82	1⅝	300	41.1	$0.60	3000
7	MR16	GU5.3	41465-6	▶	7MR16/END/S15 2700 12V DIM	12	MR16 Spot 15° Dim✤	10	40,000	2580	80	2⅛	325	36.5	$0.84	2700
			41466-4	▶	7MR16/END/S15 3000 12V DIM	12	MR16 Spot 15° Dim✤	10	40,000	2680	80	2⅛	345	36.5	$0.84	3000
			41468-0		7MR16/END/F24 2700 12V DIM	12	MR16 Flood 24° Dim✤	10	40,000	1450	82	2⅛	360	36.5	$0.84	2700
			41471-4		7MR16/END/F36 2700 12V DIM	12	MR16 Wide Flood 36° Dim✤	10	40,000	820	84	2⅛	335	36.5	$0.84	2700
			41469-8		7MR16/END/F24 3000 12V DIM	12	MR16 Flood 24° Dim✤	10	40,000	1520	82	2⅛	380	36.5	$0.84	3000
			41472-2		7MR16/END/F36 3000 12V DIM	12	MR16 Wide Flood 36° Dim✤	10	40,000	900	82	2⅛	360	36.5	$0.84	3000
10	MR16	GU5.3	41474-8	▶	10MR16/END/S15 2700 DIM 10/1	12	MR16 Spot 15° Dim✤	10	25,000	3320	80	2⅛	405	22.8	$1.20	2700
			41475-5	▶	10MR16/END/S15 3000 DIM 10/1	12	MR16 Spot 15° Dim✤	10	25,000	3560	80	2⅛	435	22.8	$1.20	3000
			42016-6	■	10MR16/END/F24 2700 DIM 10/1	12	MR16 Flood 24° Dim✤	10	25,000	1920	83	2	480	22.8	$1.20	2700
			42017-4	■	10MR16/END/F24 3000 DIM 10/1	12	MR16 Flood 24° Dim✤	10	25,000	1980	82	2	495	22.8	$1.20	3000
			41478-9		10MR16/END/F24 3000 12V DIM	12	MR16 Flood 24° Dim✤	10	25,000	1990	83	2	475	22.8	$1.20	3000
			41479-7	▶	10MR16/END/F24 4000 DIM 10/1	12	MR16 Flood 24° Dim✤	10	25,000	2060	84	2⅛	440	22.8	$1.20	4000
			42018-2	■	10MR16/END/F35 2700 DIM 10/1	12	MR16 Wide Flood 35° Dim✤	10	25,000	1260	83	2	470	22.8	$1.20	2700
			42019-0	■	10MR16/END/F35 3000 DIM 10/1	12	MR16 Wide Flood 35° Dim✤	10	25,000	1300	82	2	485	22.8	$1.20	3000
			41482-1		10MR16/END/F36 4000 12V DIM	12	MR16 Wide Flood 36° Dim✤	10	25,000	1020	84	2	410	22.8	$1.20	4000
LED PAR16 GU10 Lamps ▶																
6	PAR16	GU10	42350-9		6PAR16/F25 3000 120V 10/1	120	PAR16 Twistline GU10 Flood 25°	10	45,000	1050	85	2⅛	300	41.1	$0.72	3000
				●												
LED PAR20 Lamps																
8	PAR20	Med.	42612-2	● ■	8PAR20/END/F25 2700 DIM 6/1	120	PAR20 Flood 25° Dim✤	6	45,000	2300	84	3⅜	450	41.1	$0.84	2700
			42613-0	● ■	8PAR20/END/F25 3000 DIM 6/1	120	PAR20 Flood 25° Dim✤	6	45,000	2400	84	3⅜	470	41.1	$0.84	3000
			42614-8	● ■	8PAR20/END/F25 4000 DIM 6/1	120	PAR20 Flood 25° Dim✤	6	45,000	2400	84	3⅜	470	41.1	$0.84	4000
			42615-5	● ■	8PAR20/END/F36 2700 DIM 6/1	120	PAR20 Wide Flood 36° Dim✤	6	45,000	1100	84	3⅜	450	41.1	$0.84	2700
			42616-3	● ■	8PAR20/END/F36 3000 DIM 6/1	120	PAR20 Wide Flood 36° Dim✤	6	45,000	1100	84	3⅜	470	41.1	$0.84	3000
			42617-1	● ■	8PAR20/END/F36 4000 DIM 6/1	120	PAR20 Wide Flood 36° Dim✤	6	45,000	1100	84	3⅜	470	41.1	$0.84	4000

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LED symbols and footnotes located on page 13



5.5W MR16 GU5.3



7W & 10W MR16 GU5.3



6W PAR16 GU10



8W PAR20 Med.

LED Lamps

LED PAR30S and PAR30L Lamps

Watts	Bulb Type	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Description	Case Qty.	Rated Avg. Life (Hrs.) (501,502)	Approx. MBCP[]	CRI	MOL (In.)	Approx. Lumens (503)	Life (Yrs.) (446)	Energy Cost (445)	Color Temp. (K)
														FTC REQUIREMENTS¥		
LED Single Optic PAR30S Lamps																
12	PAR30S	Med.	42692-4	■●	12PAR30S/F25 2700 AF RO 6/1	120	PAR30S, Flood 25°, 2700K	6	25,000	5000	80	3.5	850	22.8	1.45	2700
			42693-2	■●	12PAR30S/F25 3000 AF RO 6/1	120	PAR30S, Flood 25°, 3000K	6	25,000	5300	80	3.5	900	22.8	1.45	3000
			42694-0	■●	12PAR30S/F25 4000 AF RO 6/1	120	PAR30S, Flood 25°, 4000K	6	25,000	5500	81	3.5	950	22.8	1.45	4000
			42695-6	●	12PAR30S/F36 2700 AF RO 6/1	120	PAR30S, Flood 36°, 2700K	6	25,000	1850	80	3.5	850	22.8	1.45	2700
			42696-4	■●	12PAR30S/F36 3000 AF RO 6/1	120	PAR30S, Flood 36°, 3000K	6	25,000	1960	80	3.5	900	22.8	1.45	3000
			42697-2	■● ▶	12PAR30S/F36 4000 AF RO 6/1	120	PAR30S, Flood 36°, 4000K	6	25,000	2100	82	3.5	950	22.8	1.45	4000
LED PAR30S Lamps																
13	PAR30S	Med.	42535-5	■●	13PAR30S/S15 2700 DIM AF 6/1	120	PAR30S, Spot 15°, 2700K, Dim	6	25,000	5832	83	3.5	720	22.8	1.57	2700
			42536-3	■●	13PAR30S/S15 3000 DIM AF 6/1	120	PAR30S, Spot 15°, 3000K , Dim	6	45,000	6075	82	3.5	750	41.1	1.57	3000
			42344-2	■●	13PAR30S/F25 2700 DIM AF 6/1	120	PAR30S, Flood 25°, 2700K, Dim	6	25,000	3000	83	3.5	720	22.8	1.57	2700
			42345-9	■●	13PAR30S/F25 3000 DIM AF 6/1	120	PAR30S, Flood 25°, 3000K , Dim	6	25,000	3150	83	3.5	750	22.8	1.57	3000
			42346-7	■●	13PAR30S/F36 2700 DIM AF 6/1	120	PAR30S, Flood 36°, 2700K, Dim	6	25,000	1450	83	3.5	720	22.8	1.57	2700
			42347-5	■●	13PAR30S/F36 3000 DIM AF 6/1	120	PAR30S, Flood 36°, 3000K , Dim	6	25,000	1550	83	3.5	750	22.8	1.57	3000
LED Single Optic PAR30L Lamps																
12	PAR30S	Med.	43012-4	●	12PAR30L/F25 2700 DIM AF RO 6/1	120	PAR30L, Flood 25°, 2700K, Dim	6	25,000	3500	80	4.4	850	22.8	1.45	2700
			43013-2	●	12PAR30L/F25 3000 DIM AF RO 6/1	120	PAR30L, Flood 25°, 3000K, Dim	6	25,000	3500	80	4.4	850	22.8	1.45	3000
			43014-0	●	12PAR30L/F25 4000 DIM AF RO 6/1	120	PAR30L, Flood 25°, 4000K, Dim	6	25,000	3500	80	4.4	850	22.8	1.45	4000
			43015-7	●	12PAR30L/F36 2700 DIM AF RO 6/1	120	PAR30L, Flood 36°, 2700K, Dim	6	25,000	2000	80	4.4	850	22.8	1.45	2700
			43016-5	●	12PAR30L/F36 3000 DIM AF RO 6/1	120	PAR30L, Flood 36°, 3000K, Dim	6	25,000	2000	80	4.4	850	22.8	1.45	3000
			43017-3	● ▶	12PAR30L/F36 4000 DIM AF RO 6/1	120	PAR30L, Flood 36°, 4000K, Dim	6	25,000	2000	80	4.4	850	22.8	1.45	4000
LED AirFlux PAR30L Lamps																
13	PAR30S	Med.	42047-1	■●	13PAR30L/F25 2700 DIM AF 6/1	120	PAR30L, Flood 25°, 2700K, Dim	6	45,000	3200	83	4.4	720	41.1	1.57	2700
			42080-2	■●	13PAR30L/F25 3000 DIM AF 6/1	120	PAR30L, Flood 25°, 3000K, Dim	6	45,000	3200	80	4.4	750	41.1	1.57	3000
			42049-7	■●	13PAR30L/F36 2700 DIM AF 6/1	120	PAR30L, Flood 36°, 2700K, Dim	6	45,000	1512	82	4.4	720	41.1	1.57	2700
			42050-5	■●	13PAR30L/F36 3000 DIM AF 6/1	120	PAR30L, Flood 36°, 3000K, Dim	6	45,000	1512	81	4.4	750	41.1	1.57	3000

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LED symbols and footnotes located on page 13



12W PAR30L
Single Optic Med.



13W PAR30S
Med.



12W PAR30S
Single Optic Med.



13W PAR30L
Med.

Watts	Bulb Type	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Description	Case Qty.	Rated Avg. Life (Hrs.) (501,502)	Approx. MBCP[1]	CRI	MOL (In.)	Approx. Lumens (503)	Life (Yrs.) (446)	Energy Cost (445)	Color Temp. (K)
LED PAR38 Lamps															**FTC REQUIREMENTS***	
17	PAR38	Med.	41855-8		17PAR38/END/F25 3000-1050 OD 6/1	120	Flood 25° Dim 3000K Outdoor	6	25,000	4000	81	5.2	1050	22.8	2.05	3000
18	PAR38	Med.	42540-5		18PAR38/END/S15 2700 DIM AF 6/1✤	120	Spot 15° Dim 2700K	6	45,000	7300	83	5.2	900	41.1	2.17	2700
			42541-3		18PAR38/END/S15 3000 DIM AF 6/1✤	120	Spot 15° Dim 3000K	6	45,000	7700	83	5.2	950	41.1	2.17	3000
			42051-3		18PAR38/END/F25 2700-900 DIM AF 6/1✤	120	Flood 25° Dim 2700K	6	45,000	3900	83	5.2	900	41.1	2.17	2700
			42052-1		18PAR38/END/F25 3000-950 DIM AF 6/1✤	120	Flood 25° Dim 3000K	6	45,000	4100	82	5.2	950	41.1	2.17	3000
			42088-5		18PAR38/END/F36 2700-900 DIM AF 6/1✤	120	Flood 36° Dim 2700K	6	45,000	2050	83	5.2	900	41.1	2.17	2700
			42089-3		18PAR38/END/F36 3000-950 DIM AF 6/1✤	120	Flood 36° Dim 3000K	6	45,000	2200	84	5.2	950	41.1	2.17	3000
19.5	PAR38	Med.	42545-4		19.5PAR38/END/S15 2700 DIM AF 6/1✤	120	Flood 15° Dim 2700K	6	45,000	9100	83	5.2	1100	41.1	2.35	2700
			42547-0		19.5PAR38/END/S15 3000 DIM AF 6/1✤	120	Flood 15° Dim 3000K	6	45,000	10000	83	5.2	1200	41.1	2.35	3000
			42121-4		19.5PAR38/END/F25 2700 DIM AF 6/1✤	120	Flood 25° Dim 2700K	6	25,000	5400	84	5.2	1100	22.8	2.35	2700
			42122-2		19.5PAR38/END/F25 3000 DIM AF 6/1✤	120	Flood 25° Dim 3000K	6	25,000	5900	83	5.2	1200	22.8	2.35	3000
			42546-2		19.5PAR38/END/F36 2700 DIM AF 6/1✤	120	Flood 36° Dim 2700K	6	45,000	2310	83	5.2	1100	41.1	2.35	2700
			42548-8		19.5PAR38/END/F36 3000 DIM AF 6/1✤	120	Flood 36° Dim 3000K	6	45,000	2520	83	5.2	1200	41.1	2.35	3000
LED Single Optic PAR38 Lamps																
13	PAR38	Med.	43003-3		13PAR38/S15 2700 DIM AF RO 6/1✤	120	Spot 15° Dim 2700K	6	25,000	8500	80	5.2	900	22.8	1.57	2700
			43004-1		13PAR38/S15 3000 DIM AF RO 6/1✤	120	Spot 15° Dim 3000K	6	25,000	9000	80	5.2	950	22.8	1.57	3000
			43005-8		13PAR38/S15 4000 DIM AF RO 6/1✤	120	Spot 15° Dim 4000K	6	25,000	9000	80	5.2	1000	22.8	1.57	4000
			43006-6		13PAR38/F25 2700 DIM AF RO 6/1✤	120	Flood 25° Dim 2700K	6	25,000	5300	80	5.2	900	22.8	1.57	2700
			43007-4		13PAR38/F25 3000 DIM AF RO 6/1✤	120	Flood 25° Dim 3000K	6	25,000	5500	80	5.2	945	22.8	1.57	3000
			43008-2		13PAR38/F25 4000 DIM AF RO 6/1✤	120	Flood 25° Dim 4000K	6	25,000	5500	81	5.2	980	22.8	1.57	4000
			43009-0		13PAR38/F36 2700 DIM AF RO 6/1✤	120	Flood 36° Dim 2700K	6	25,000	1980	80	5.2	900	22.8	1.57	2700
			43010-8		13PAR38/F36 3000 DIM AF RO 6/1✤	120	Flood 36° Dim 3000K	6	25,000	2100	81	5.2	950	22.8	1.57	3000
			43011-6		13PAR38/F36 4000 DIM AF RO 6/1✤	120	Flood 36° Dim 4000K	6	25,000	2100	82	5.2	980	22.8	1.57	4000
19	PAR38	Med.	43000-9		19PAR38/S15 2700 DIM AF RO 6/1✤	120	Spot 15° Dim 2700K	6	25,000	6000	80	5.2	1200	22.8	2.29	2700
			43001-7		19PAR38/S15 3000 DIM AF RO 6/1✤	120	Spot 15° Dim 3000K	6	25,000	6500	80	5.2	1250	22.8	2.29	3000
			43002-5		19PAR38/S15 4000 DIM AF RO 6/1✤	120	Spot 15° Dim 4000K	6	25,000	6700	81	5.2	1300	22.8	2.29	4000
			42908-4		19PAR38/F25 2700 DIM AF RO 6/1✤	120	Flood 25° Dim 2700K	6	25,000	6000	80	5.2	1190	22.8	2.29	2700
			42909-2		19PAR38/F25 3000 DIM AF RO 6/1✤	120	Flood 25° Dim 3000K	6	25,000	6500	80	5.2	1250	22.8	2.29	3000
			42910-0		19PAR38/F25 4000 DIM AF RO 6/1✤	120	Flood 25° Dim 4000K	6	25,000	6700	80	5.2	1300	22.8	2.29	4000
			42911-8		19PAR38/F36 2700 DIM AF RO 6/1✤	120	Flood 36° Dim 2700K	6	25,000	2420	80	5.2	1200	22.8	2.29	2700
			42912-6		19PAR38/F36 3000 DIM AF RO 6/1✤	120	Flood 36° Dim 3000K	6	25,000	2640	80	5.2	1200	22.8	2.29	3000
			42913-4		19PAR38/F36 4000 DIM AF RO 6/1✤	120	Flood 36° Dim 4000K	6	25,000	2750	81	5.2	1200	22.8	2.29	4000

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LED symbols and footnotes located on page 13



Single Optic PAR38 Med.



Standard AirFluxPAR38 Med.

LED Lamps

LED R20, BR30, BR40 and T8 Tube Lamps

Watts	Bulb Type	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Description	Case Qty.	Rated Avg. Life (Hrs.) (501,502)	Approx. MBCP	CRI	MOL (In.)	Approx. Lumens (503)	Life (Yrs.) (446)	Energy Cost (445)	Color Temp. (K)
LED Reflector Lamps															FTC REQUIREMENTS¥	
8	R20	Med.	42881-3		8R20/F90 2700 DIM 6/1	120	BR30 Wide Flood 2700K Dim	6	25,000	__	80	3.5	530	22.8	0.96	2700
13	BR30	Med.	42055-4		13BR30/END/F90 2700-700 DIM AF 6/1	120	BR30 Wide Flood 2700K Dim	6	45,000	__	82	5.1	730	41.1	1.57	2700
			42644-5		13BR30/END/F90 22K-27K DIM 6/1	120	DimTone BR30 Wide Flood Dim	6	45,000	__	83	.1	730	41.1	1.57	2200-2700
14.5	BR40	Med.	42056-2		14BR40/END/S90 2700-800 DIM AF 6/1	120	BR40 Wide Flood 2700K Dim	6	45,000	__	82	6.5	800	41.1	1.75	2700
15	DL	Med.	42351-7		15DL6/END/F90 2700 DIM 6/1	120	6" Downlight Dimmable LED	6	45,000	__	82	6.9	800	41.1	1.81	2700

Watts	Bulb Type	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Description	Pkg. Qty.	CRI	Rated Avg. Life (Hrs.) (501,502)	Nom. Length (In.)	Approx. Lumens (504)	Life (Yrs.) (446)	Energy Cost (445)	Color Temp. (K)
LED T8 Specifier Series Lamp*													FTC REQUIREMENTS		
10	T8	G13	42182-6	▢	10T8/END/24-3500 UNV 10/1	100–277	Linear LED T8 Tube, 3500K	10	85	40,000	24	825	36.5		3500
			42186-7	▢	10T8/END/24-4000 UNV 10/1	100–277	Linear LED T8 Tube, 4000K	10	85	40,000	24	825	36.5		4000
19	T8	G13	42183-4	▢	19T8/END/48-3500 UNV 10/1	100–277	Linear LED T8 Tube, 3500K	10	85	40,000	48	1650	36.5		3500
			42187-5	▢	19T8/END/48-4000 UNV 10/1	100–277	Linear LED T8 Tube, 4000K	10	85	40,000	48	1650	36.5		4000
LED T8 Specifier Series T8 External Driver															
22.5	T8		42719-5	▢	22T8/EXT/48-3500K UNV	100–277		10	85	50,000	24	2500	xx		3500
			42720-3	▢	22T8/EXT/48-4000K UNV	100–277		10	85	50,000	24	2500	xx		4000
			42721-1	▢	22T8/EXT/48-6500K UNV	100–277		10	85	50,000	24	2500	xx		6500

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LED symbols and footnotes located on page 13
* Product currently not available in Canada


R20 Med.


BR30 Med.


BR40 Med.


Downlight Dimmable LED Med.


T8 Specifier Series System

Watts	Bulb Type	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Description	Case Qty.	Rated Avg. Life (Hrs.) (501,502)	Approx. MBCP	CRI	MOL (In.)	Approx. Lumens (503)	Life (Yrs.) (446)	Energy Cost (445)	Color Temp. (K)
															FTC REQUIREMENTS	
Standard Incandescent A19 60W ENERGY STAR® Equivalent†																
10.5	A19	Med	43051-2		10.5A19/COREPRO/3000 6/1	120		6	20,000		80	4	800			3000
Standard Incandescent BR 65W ENERGY STAR® Equivalent†																
9.5	BR30	Med	42949-8		9.5BR30/COREPRO/F90 2700 AF 6/1	120		6	25,000		80	5 1/16	650			2700
Standard Incandescent BR 75W ENERGY STAR® Equivalent†																
13	PAR38	Med.	42612-2		13PAR38/COREPRO/F25 2700 AF 6/1	120		6	25,000		80	5 1/8	830			2700
			42633-8		13PAR38/COREPRO/F25 3000 AF 6/1	120		6	25,000		80	5 1/8	830			3000
			42634-6		13PAR38/COREPRO/F25 4000 AF 6/1	120		6	25,000		80	5 1/8	830			4000
CorePRO TLED																
8	G13	Med.	42983-7		8T8/COREPRO/24-4000K LR UNV	120		6	30,000		80	5 1/8	700			4000
10	G13	Med.	42981-1		10T8/COREPRO/24-3000K FRST UNV	120		6	30,000		80	5 1/8	750			3000
			42982-9		10T8/COREPRO/24-4000K FRST UNV	120		6	30,000		80	5 1/8	800			4000
16	G13	Med.	42977-9		16T8/COREPRO/48-4000K LR UNV	120		6	30,000		80	5 1/8	1400			4000
20	G13	Med.	42975-3		20T8/COREPRO/48-3000K FRST UNV	120		6	30,000		80	5 1/8	1500			3000
			42976-1		20T8/COREPRO/48-4000K FRST UNV	120		6	30,000		80	5 1/8	1600			4000

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LED symbols and footnotes located on page 13

† All Philips LED PAR, BR, and MR16 equivalencies for light output are based upon the Energy Star® Integral LED Lamp Center Beam Intensity Benchmark tool which can be found at: www.EnergyStar.gov/LEDbulbs, LED Light Bulbs for Partners, Program Requirements PDF, Page 11. A-shape and decorative candles are calculated on lumen values, not the ENERGY STAR® Integral LED Lamp Center Beam Intensity Benchmark tool.

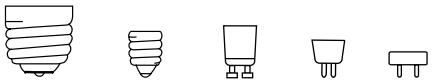


A19 Med. BR30 Med. PAR38 Med. G13 Med.

LED Lamps

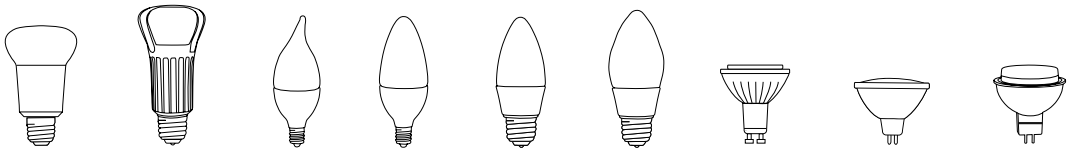
LED Base Types and Bulb Shapes

LED Base Types (Not Actual Sizes)

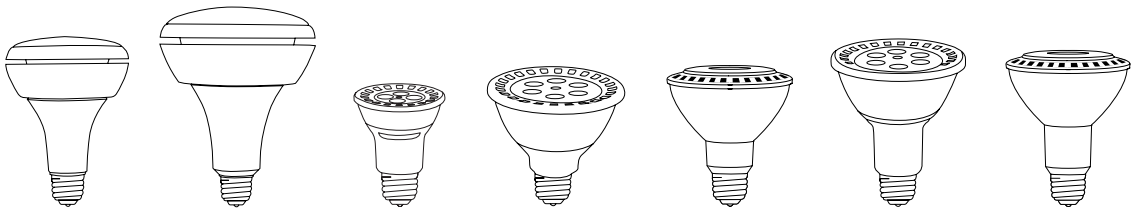


Med. Medium | Cand. Candelabra | GU10 | GU5.3 | G13

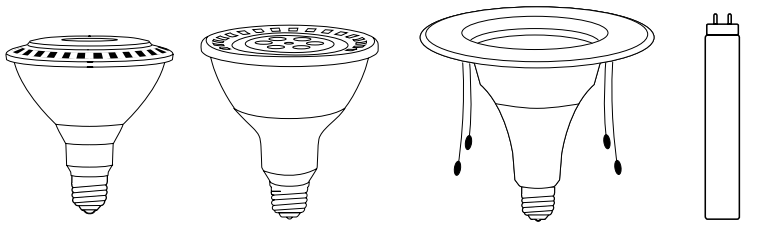
LED Bulb Shapes (Not Actual Sizes)



A19 | A21 | BA11 | B11 | B12 | F15 | GU10 | MR16 Flood | MR16 Spot



BR30 | Airflux BR40 | 8W Airflux PAR20 | Airflux PAR30S | Retail Optic PAR30S | Airflux PAR30L | Retail Optic PAR30L



Retail Optic PAR38 | Airflux PAR38 | Downlight Dimmable LED | T8 Tube

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▯ Maximum Beam Candlepower

✤ Dimmable when using leading edge dimmers. See Philips Website (www.philips.com/ledtechguide) for compatible leading edge dimmers.

▢ Exclusive to Philips Lighting Company

■ ENERGY STAR Bulb: As an ENERGY STAR Partner, Philips has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

◗ Make to order lamps.

● Uses AirFlux Technology.

▲ 90 CRI enables superior color rendition.

● Suitable for wet locations.

¥ For more information about FTC requirements please see rule 16 CFR part 305 @ www.ftc/os/2000/02/16cfr305.

(445) Estimated energy cost is based on 3 hrs/day, 11¢/kWh. Cost depends on rates and use.

(446) Life in years is based on 3 hrs/day.

(501) Rated average life is the length of operation (in hours) at which point an average of 50% of the lamps will still be operational and 50% will not.

(502) Rated average life based on engineering testing and probability analysis.

(503) Lifetime testing consistent with IES LM-80, Lumen Maintenance Procedure.

(504) Photometric testing consistent with IES LM-79.

(505) Maximum power consumed at start-up. Steady state power consumption will be less.

(506) Minimum Lumen Maintenance is the minimum number of hours after which the LED light output depreciates to 70% of its initial output. This value, L_{70}, is tested @ 25°C ambient temperature. (IES LM-80)

(507) The LED Fixture, Initial Lumens is determined as prescribed in IESNA LM-79, Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products, which specifies lumen measurements of the fixture be reported after the measurements have stabilized at 25°C.

(508) Photometric testing consistent with IES LM-79. Maximum Beam Candlepower.

c UL us
LISTED
LED LAMPS 3 PRR E317295

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ALTO lamp technology with green endcaps has become synonymous with environmental responsibility and low mercury.

Reduce your energy and maintenance costs

The Philips Linear Fluorescent lamp portfolio offers some of the lowest mercury and longest life lamps in the industry.

Philips Energy Advantage T8 25W featuring ALTO II Technology offers high energy savings in an environmentally responsible lamp. Save 7 watts per lamp instantly when compared to a T8 32W lamp.

Philips Energy Advantage T8 XLL 25W featuring ALTO II Technology will last 53% longer than an industry standard 4' T8 32W lamp* (12hrs per start on an instant start ballast), and provide a cost saving solution that is better for the environment.

Philips Energy Advantage T5 HO 49W featuring ALTO Lamp Technology is the only energy saving T5 lamp that saves you 5W by just changing a lamp (compared to a T5 54W lamp) with no sacrifice to performance.

Current Product	Philips Upgrade Product	Benefit	Page
32W 4ft T8	Energy Advantage T8 4ft 25W featuring ALTO II Technology	• Saves 7W per lamp • 97% lumen maintenance • Up to 38,000 hours rated average life†; 42 month lamp warranty period**	21
32W 4ft T8	Energy Advantage T8 XLL 4ft 25W featuring ALTO II Technology	• Saves 7W per lamp • 97% lumen maintenance • Up to 46,000 hours rated average life†; 48 month lamp warranty period**	23
54W 4ft T5 HO	Energy Advantage T5 HO 44W featuring ALTO Lamp Technology	• Saves 10W per lamp • 40,000 hours rated average life for an extended relamping cycle†	17

† Average life under engineering data with lamps turned off and restarted once every 12 operating hours.
* When replacing a standard 4' T8 32W lamp with 30,000 hours rated average life and 2850 lumens with a Philips Energy Advantage T8 32W with 46,000 hours rated average life and 2400 lumens. Rated average life based on 12 hours per start on an instant start ballast.
**Limitations and restrictions apply, go to www.philips.com/warranties for more information

Philips T5 Fluorescent Lamps featuring ALTO Technology

Powerful, environmentally-responsible, ultra-slim lamps



- ✓ Industry low 1.4mg of mercury in all Philips T5 and T5HO lamps
- ✓ No burn in required before dimming Philips T5 and T5HO lamps
- ✓ Operate on programmed start ballast only to maintain warranty
- ✓ Lumen output ratings at 35°C, lumens at 25°C, average 10% lower

T5 High Efficiency

- New 25W Energy Advantage version of 28W
- Up to 116 lumens per watt
- 5000 kelvin being added to all sizes
- Slim profile lamp and ballast
- Perfect for office, healthcare and government applications

T5 High Output

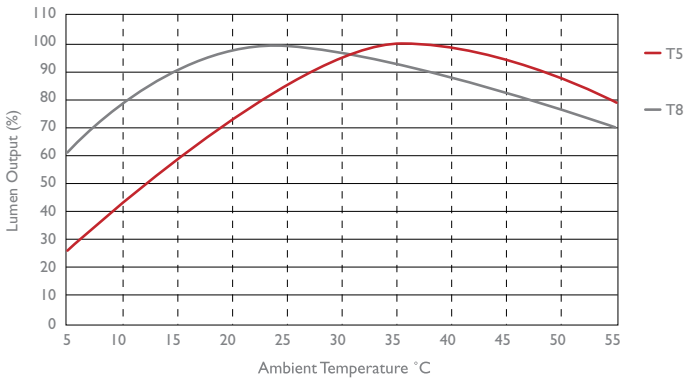
- New 49W HO Energy Advantage version of 54W HO
- 49W HO also available in extreme temperature version
- T5HO offers superb high bay options
- Increased energy saving options for many applications
- Perfect for retail, industrial and warehouse applications

Philips T5 Lamp Warranty Periods

Philips Lamp	Warranty period*	
	3 Hr. Start	12 Hr. Start
T5HE—14W, 21W, 28W and 35W	30 Months	36 Months
T5HE Energy Advantage F28T5/800/EA/ALTO 25W	36 Months	42 Months
T5HO—24W, 39W and 54W	30 Months	36 Months
T5HO—Energy Advantage F54T5/800/HO/EA/ALTO 49W	36 Months	42 Months
T5HO—Extra Energy Advantage F54T5/800/HO/EA/ALTO 44W	42 Months	48 Months

* Certain limitations and conditions apply. See Philips for further warranty details.

T5/T8 Lumens vs. Temperature



Philips T5 Lamp Family—Life Ratings

Products	Programmed Start[1] Rated Average Life (Hrs.)[2]	
	3 Hr. Start	12 Hr. Start
T5HE—14W, 21W, 28W and 35W	25,000	35,000
T5HE Energy Advantage F28T5/800/EA/ALTO 25W	35,000	40,000
T5HO—24W, 39W and 54W	25,000	35,000
T5HO—Energy Advantage F54T5/800/HO/EA/ALTO 49W	35,000	40,000
T5HO—Extra Energy Advantage F54T5/800/HO/EA/ALTO 44W	35,000	40,000

1) Average life under engineering data on programmed start ballast with lamps turned off and restarted once every 3 or 12 operating hours as noted.
2) Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not.

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
T5 High Output (HO) Energy Advantage Lamps											
T5 Miniature Bipin; Programmed Start (226)											
44	41781-6	● Ⓔ	F54T5/835/HO/XEW/ALTO 44W	40	TL 835, 3500K	46	35,000	40,000	4500	4275	85
	41782-4	● Ⓔ	F54T5/841/HO/XEW/ALTO 44W	40	TL 841, 4100K	46	35,000	40,000	4500	4275	85
	41783-2	● Ⓔ	F54T5/850/HO/XEW/ALTO 44W	40	TL 850, 5000K	46	35,000	40,000	4320	4100	82
49	22049-1	● Ⓔ	F54T5/830/HO/EA/ALTO 49W	40	TL 830, 3000K	46	35,000	40,000	5000	4750	85
	22050-9	● Ⓔ	F54T5/835/HO/EA/ALTO 49W	40	TL 835, 3500K	46	35,000	40,000	5000	4750	85
	22052-5	● Ⓔ	F54T5/841/HO/EA/ALTO 49W	40	TL 841, 4100K	46	35,000	40,000	4800	4600	85
	40649-6	● Ⓔ	F54T5/850/HO/EA/ALTO 49W	40	TL 850, 5000K	46	35,000	40,000	4850	4625	82
T5 High Output (HO) Energy Advantage Lamps "Extreme Temperature" with Amalgam Technology											
T5 Miniature Bipin; Programmed Start (226)											
49	40729-6	● Ⓔ	F54T5/835/HO/A/EA/ALTO 49W	40	TL 835, 3500K	46	35,000	40,000	5000	4750	85
	40730-4	● Ⓔ	F54T5/841/HO/A/EA/ALTO 49W	40	TL 841, 4100K	46	35,000	40,000	5000	4750	85
	40752-8	● Ⓔ	F54T5/850/HO/A/EA/ALTO 49W	40	TL 850, 5000K	46	35,000	40,000	4800	4600	82
T5 High Output (HO) Lamps—(2ft–4ft)											
T5 Miniature Bipin; Programmed Start (226)											
24	29019-7	●	F24T5/830/HO/ALTO	40	TL 830, 3000K	22	25,000	35,000	1950	1850	85
	29020-5	●	F24T5/835/HO/ALTO	40	TL 835, 3500K	22	25,000	35,000	1950	1850	85
	29021-3	●	F24T5/841/HO/ALTO	40	TL 841, 4100K	22	25,000	35,000	1950	1850	85
	41277-5	●	F24T5/850/HO/ALTO	40	TL 850, 5000K	22	25,000	35,000	1870	1775	82
39	29022-1	●	F39T5/830/HO/ALTO	40	TL 830, 3000K	34	25,000	35,000	3500	3325	85
	29023-9	●	F39T5/835/HO/ALTO	40	TL 835, 3500K	34	25,000	35,000	3500	3325	85
	29025-4	●	F39T5/841/HO/ALTO	40	TL 841, 4100K	34	25,000	35,000	3500	3325	85
	41435-9	●	F39T5/850/HO/ALTO	40	TL 850, 5000K	34	25,000	35,000	3360	3190	82
54	29026-2	● Ⓔ	F54T5/830/HO/ALTO	40	TL 830, 3000K	46	25,000	35,000	5000	4750	85
	29028-8	● Ⓔ	F54T5/835/HO/ALTO	40	TL 835, 3500K	46	25,000	35,000	5000	4750	85
	29083-3	● Ⓔ	F54T5/841/HO/ALTO	40	TL 841, 4100K	46	25,000	35,000	5000	4750	85
	13510-3	● Ⓔ	F54T5/850/HO/ALTO	40	TL 850, 5000K	46	25,000	35,000	4800	4600	82
	14745-4	● Ⓔ	F54T5/865/HO/ALTO	40	TL 865, 6500K	46	25,000	35,000	4650	4415	82

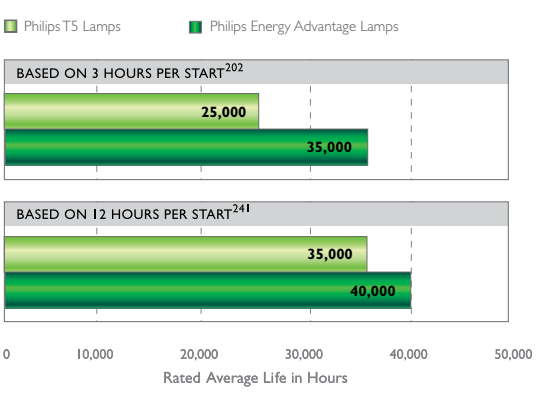
For the most current product information, go to the e-catalog on **www.philips.com**

Fluorescent symbols and footnotes located on page 40

Rated Average Life

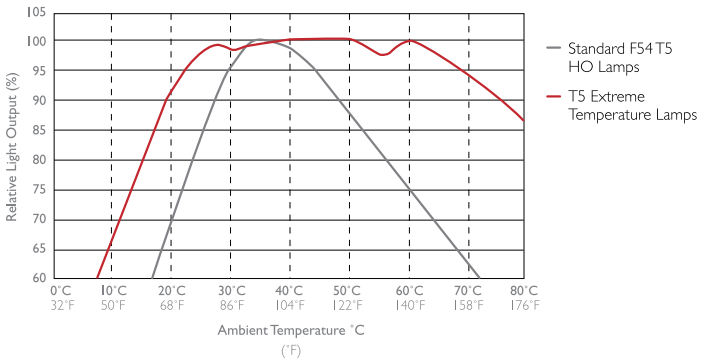


T5 Miniature Bipin



Performance (Relative Light Output vs. Temperature)

Philips T5 Extreme Temperature Lamps vs. Standard F54T5 Lamps



Fluorescent Lamps

T5, Colored Linear Fluorescent Lamps

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
Energy Advantage T5 Lamps —(4ft)											
T5 Miniature Bipin; Programmed Start (226)											
25	40631-4	●	F28T5/835/EA/ALTO 25W	40	TL 835, 3500K	46	35,000	40,000	2900	2750	85
	40632-2	●	F28T5/841/EA/ALTO 25W	40	TL 841, 4100K	46	35,000	40,000	2900	2750	85
	41420-1	●	F28T5/850/EA/ALTO 25W	40	TL 850, 5000K	46	35,000	40,000	2780	2640	82
T5 High Efficiency Lamps—(2ft–5ft)											
T5 Miniature Bipin; Programmed Start (226)											
14	23077-1	●	F14T5/830/ALTO	40	TL 830, 3000K	22	25,000	35,000	1350	1275	85
	23079-7	●	F14T5/835/ALTO	40	TL 835, 3500K	22	25,000	35,000	1350	1275	85
	23080-5	●	F14T5/841/ALTO	40	TL 841, 4100K	22	25,000	35,000	1350	1275	85
21	23081-3	●	F21T5/830/ALTO	40	TL 830, 3000K	34	25,000	35,000	2100	2000	85
	23082-1	●	F21T5/835/ALTO	40	TL 835, 3500K	34	25,000	35,000	2100	2000	85
	23083-9	●	F21T5/841/ALTO	40	TL 841, 4100K	34	25,000	35,000	2100	2000	85
28	23084-7	● Ⓔ	F28T5/830/ALTO	40	TL 830, 3000K	46	25,000	35,000	2900	2750	85
	23085-4	● Ⓔ	F28T5/835/ALTO	40	TL 835, 3500K	46	25,000	35,000	2900	2750	85
	40485-3	● Ⓔ	F28T5/835/ALTO	6	TL 835, 3500K	46	25,000	35,000	2900	2750	85
	23086-2	● Ⓔ	F28T5/841/ALTO	40	TL 841, 4100K	46	25,000	35,000	2900	2750	85
35	23088-8	●	F35T5/830/ALTO	40	TL 830, 3000K	58	25,000	35,000	3650	3450	85
	23095-3	●	F35T5/841/ALTO	40	TL 841, 4100K	58	25,000	35,000	3650	3450	85

For the most current product information, go to the e-catalog on **www.philips.com**
Fluorescent symbols and footnotes located on page 40

T5 Lumens at 35°C and 25°C

Lamp Type	Approx. Initial Lumens at 35° C (203, 204)	Approx. Initial Lumens at 25° C (203, 204)
F14T5	1350	1175
F21T5	2100	1800
F28T5	2900	2625
F35T5	3650	3275
F24T5/HO	1950	1675
F39T5/HO	3500	3100
F54T5/HO	5000	4450



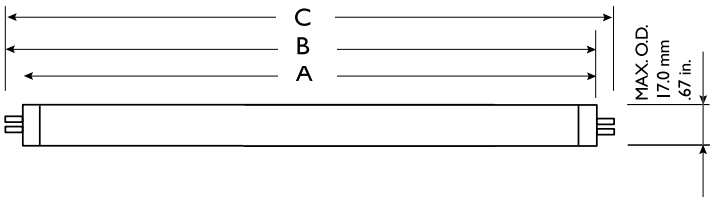
T5 Miniature Bipin

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
T5 Circular Fluorescent Lamps										
2GX13 Base; Programmed Start										
22	16601-7		TL5C 22W/830	10	Formerly FC9T5/830	9 OD	16,000	1800	1530	85
	16600-9		TL5C 22W/840	10	Formerly FC9T5/841	9 OD	16,000	1800	1530	85
40	14859-3		TL5C 40W/835	10	Formerly FC12T5/835	12 OD	16,000	3300	2805	85
55	16593-6		TL5C 55W/830	10	Formerly FC12T5/830/HO	12 OD	16,000	4200	3580	85
	16592-8		TL5C 55W/840	10	Formerly FC12T5/841/HO	12 OD	16,000	4200	3580	85
Preheat Fluorescent Lamps										
T5 Miniature Bipin; Requires Use of Starters										
4	33236-1		F4T5/CW	25	Cool White, 4100K	6	6000	135	95	59
6	33241-1		F6T5/CW	25	Cool White, 4100K	9	7500	295	230	59
8	33247-8		F8T5/CW	25	Cool White, 4100K	12	7500	400	300	59
13	33253-6		F13T5/CW	25	Cool White, 4100K	21	7500	820	655	59
	20703-5		F13T5/30U	25	Ultralume, 3000K	21	7500	1000	800	85

For the most current product information, go to the e-catalog on **www.philips.com**
Fluorescent symbols and footnotes located on page 40


T5 Circular


T5 Miniature Bipin



T5 and T5 High Output Dimensions (226)

Type	A Max. (Width)		B Min. (Width)		B Max. (Width)		C Max. (Width)	
	inches	mm	inches	mm	inches	mm	inches	mm
T5 14W/24W	21.61	549.0	21.80	553.7	21.89	556.1	22.17	563.2
T5 21W/39W	33.42	849.0	33.61	853.7	33.70	856.1	33.98	863.2
T5 28W/54W	45.24	1149.0	45.42	1153.7	45.52	1156.1	45.80	1163.2
T5 35W/80W	57.05	1449.0	57.23	1453.7	57.33	1456.1	57.61	1463.2

Philips ALTO II Technology

Philips T8 Fluorescent Lamps featuring ALTO II Technology
Better for your business, better for the environment



ALTO lamps with green endcaps have become synonymous with environmental responsibility and low mercury. Since the launch of ALTO Lamp Technology in 1995, 2.0 billion Philips fluorescent lamps with ALTO Lamp Technology have been produced with over 20 tons less mercury than previous non-ALTO lamps[1].

Philips launched ALTO II Technology in 2007. ALTO II Technology has 50% less mercury than prior T8 lamps featuring ALTO Technology, making these lamps the most sustainable linear fluorescents available. Best of all, these lamps offer the same performance levels as ALTO lamps (life, energy, and light output).

Philips T8 Lamp Warranty Periods[2]

Philips Lamp	Instant Start Warranty (3hr/12hr starts)	Programmed Start Warranty (3hr/12hr starts)
T8 700 and 800 Series	30/30 Months	30/36 Months
Advantage T8 32W High Lumen	30/30 Months	36/36 Months
PLUS T8 32W	36/42 Months	42/48 Months
Energy Advantage and Value Energy Advantage 25W	36/42 Months	48/54 Months
T8 32W Extra Long Life (XLL)	42/48 Months	48/60 Months
Energy Advantage T8 25W and 28W (XLL) Extra Long Life	42/48 Months	48/60 Months

Did you know?

- ALTO II T8 lamps have warranty periods ranging from 2½–4 years[3]
- ALTO II T8 lamps require no burn in before dimming
- ALTO II T8 lamps can contribute to LEED-EB certification. For more information, go to ww.usgbc.org

Philips T8 Lamp Family—Life ratings

Philips Lamp	Instant Start[4]		Programmed Start[5]	
	3 hours	12 hours	3 hours	12 hours
T8 700 and 800 Series	24,000	30,000	30,000	36,000
Advantage T8 32W High Lumen	24,000	30,000	30,000	36,000
PLUS T8 32W	30,000	36,000	38,000	44,000
Energy Advantage and Value Energy Advantage 25W and 28W	32,000	38,000	38,000	44,000
T8 32W Extra Long Life (XLL)	40,000	46,000	46,000	52,000
Energy Advantage T8 25W and 28W (XLL) Extra Long Life	40,000	46,000	46,000	52,000

1) [1994 industry average (22.8mg)—PLC average (4.0mg)] x 2 billion lamps. Convert to pounds by dividing by 464. Convert to tons by dividing by 2000.
2) Conditions apply—Based on maximum annual burn hours of 5110. Please contact Philips for warranty conditions for use of other equipment, including sensors.
3) Warranty Periods: 700 & 800 Series T8–30 months; Energy Advantage T8–36 months; PLUS T8–36 months; and Advantage T8–36 months; Extra Long Life T8–48 months; Energy Advantage Extra Long Life T8–48 months.
4) Average life under engineering data on instant start ballast with lamps turned off and restarted once every 3 or 12 operating hours as indicated.
5) Average life under engineering data on programmed start ballast with lamps turned off and restarted once every 3 or 12 operating hours as noted.

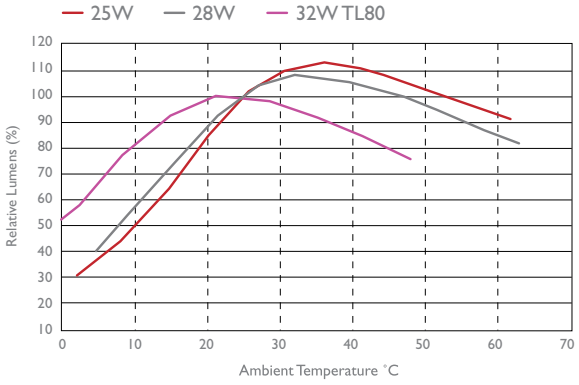
Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
Energy Advantage T8 25 Watt Fluorescent Lamps											
T8 Medium Bipin Featuring ALTO II Technology											
25	28204-6	Ⓔ ●	F32T8/ADV830/XEW/ALTO 25 Watt	30	Advantage 830, 3000K	48	32,000	38,000	2500	2450	85
	28209-5	Ⓔ ●	F32T8/ADV835/XEW/ALTO 25 Watt	30	Advantage 835, 3500K	48	32,000	38,000	2500	2450	84
	28078-4	Ⓔ ●	F32T8/ADV841/XEW/ALTO 25 Watt	30	Advantage 841, 4100K	48	32,000	38,000	2500	2450	82
	15238-9	Ⓔ ●	F32T8/ADV841/XEW/ALTO 25 Watt	10	Advantage 841, 4100K, 10PK	48	32,000	38,000	2500	2450	82
	28079-2	Ⓔ ●	F32T8/ADV850/XEW/ALTO 25 Watt	30	Advantage 850, 5000K	48	32,000	38,000	2400	2350	82
Energy Advantage T8 28 Watt Fluorescent Lamps											
T8 Medium Bipin Featuring ALTO II Technology											
28	28101-4	Ⓔ ●	F32T8/ADV830/EW/ALTO 28 Watt	30	Advantage 830, 3000K	48	32,000	38,000	2725	2645	85
	28102-2	Ⓔ ●	F32T8/ADV835/EW/ALTO 28 Watt	30	Advantage 835, 3500K	48	32,000	38,000	2725	2645	84
	28103-0	Ⓔ ●	F32T8/ADV841/EW/ALTO 28 Watt	30	Advantage 841, 4100K	48	32,000	38,000	2725	2645	82
	28105-5	Ⓔ ●	F32T8/ADV850/EW/ALTO 28 Watt	30	Advantage 850, 5000K	48	32,000	38,000	2675	2595	82

For the most current product information, go to the e-catalog on **www.philips.com**

Fluorescent symbols and footnotes located on page 40

Relative Light Output vs. Ambient Temperature

4' T8 Lamps—0.88 BF Ballast



Relative light output with respect to 25°C rated temperature

Energy Advantage 25W T8 Savings

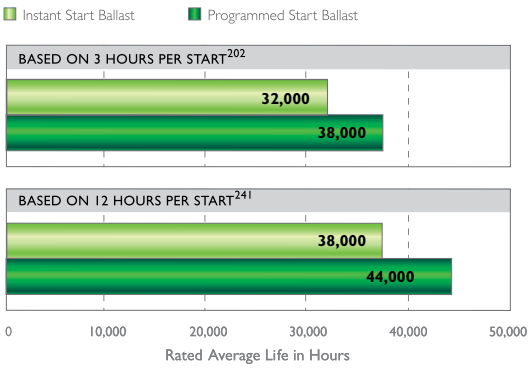
Save 7 Watts Instantly			
7 watts per lamp saved	Energy Savings Calculator		
	Annual Operating Hours**		Savings Over Lamp Life
KWH Rate	4380	8760	38,000 hrs.
$0.06	$1.84	$3.68	$15.96
$0.08	$2.45	$4.90	$20.28
$0.10	$3.07	$6.13	$26.60
$0.12	$3.68	$7.36	$31.92
$0.20	$6.13	$12.26	$53.20

** 4380 hours are based on operating the lamps 12 hours per day/7 days per week.
8760 hours are based on operating the lamps 24 hours per day/7 days per week.



T8 Medium Bipin

Rated Average Life



Cost of Ownership Savings

Energy Advantage T8 fluorescent lamps vs. standard T8 lamps.

General Overview

Energy Advantage 25W T8 fluorescent lamps provide energy savings of up to 25% versus standard 32W T8, so the benefits and financial impact can be significant.

Benefits

By using Energy Advantage 25W T8 lamps the energy savings of 7 watts per lamp can be achieved instantly by simply changing the lamp.

Financial Impact

Energy Savings per Lamp	7 W
Operating Hours per Year	8760 hours, continuous burn
Cost per kWh	$ .10

Cost of Ownership Savings = $6.13 per lamp per year

Fluorescent Lamps

Value Energy Advantage T8 Lamps

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208, 239)	CRI
Energy Advantage T8 Value 28 Watt Fluorescent Lamps											
T8 Medium Bipin Featuring ALTO II Technology											
28	42417-6	Ⓔ ●	F32T8/VEA835/EW/ALTO 28W	30	Value Energy Advantage 835, 3500K	48	32,000	38,000	2600	2550	82
	42419-2	Ⓔ ●	F32T8/VEA841/EW/ALTO 28W	30	Value Advantage 841, 4100K	48	32,000	38,000	2600	2550	82
	42421-8	Ⓔ ●	F32T8/VEA850/EW/ALTO 28W	30	Value Advantage 850, 5000K	48	32,000	38,000	2600	2550	82
Energy Advantage T8 Value 25 Watt Fluorescent Lamps											
T8 Medium Bipin Featuring ALTO II Technology											
25	42418-4	Ⓔ ●	F32T8/VEA835/XEW/ALTO 25W	30	Value Energy Advantage 835, 3500K	48	32,000	38,000	2300	2250	82
	42420-0	Ⓔ ●	F32T8/VEA841/XEW/ALTO 25W	30	Value Advantage 841, 4100K	48	32,000	38,000	2300	2250	82
	42422-6	Ⓔ ●	F32T8/VEA850/XEW/ALTO 25W	30	Value Advantage 850, 5000K	48	32,000	38,000	2300	2250	82

For the most current product information, go to the e-catalog on **www.philips.com**

Fluorescent symbols and footnotes located on page 40



T8 Medium Bipin

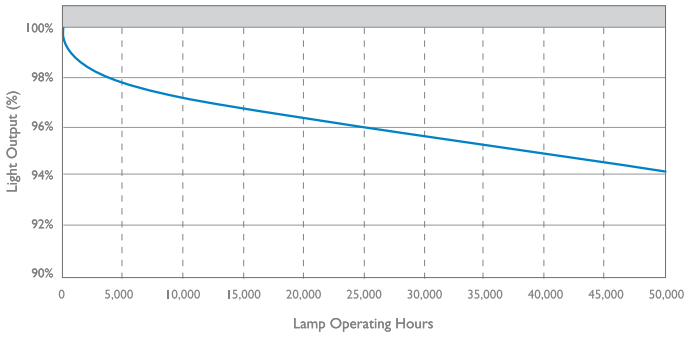
Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
Extra Long Life Energy Advantage 25 Watt T8 Fluorescent Lamp											
T8 Medium Bipin Featuring ALTO II Technology											
25	28121-2	●	F32T8/ADV830/XLL/ALTO 25 Watt	30	Advantage 830, 3000K	48	40,000	46,000	2400	2330	85
	28122-0	●	F32T8/ADV835/XLL/ALTO 25 Watt	30	Advantage 835, 3500K	48	40,000	46,000	2400	2330	84
	28123-8	●	F32T8/ADV841/XLL/ALTO 25 Watt	30	Advantage 841, 4100K	48	40,000	46,000	2400	2330	82
	28125-3	●	F32T8/ADV850/XLL/ALTO 25 Watt	30	Advantage 850, 5000K	48	40,000	46,000	2350	2280	82
Extra Long Life Energy Advantage 28 Watt T8 Fluorescent Lamp											
T8 Medium Bipin Featuring ALTO II Technology											
28	28146-9	●	F32T8/ADV830/XLL/ALTO 28 Watt	30	Advantage 830, 3000K	48	40,000	46,000	2675	2595	85
	28148-5	●	F32T8/ADV835/XLL/ALTO 28 Watt	30	Advantage 835, 3500K	48	40,000	46,000	2675	2595	84
	28127-9	●	F32T8/ADV841/XLL/ALTO 28 Watt	30	Advantage 841, 4100K	48	40,000	46,000	2675	2595	82
	28128-7	●	F32T8/ADV850/XLL/ALTO 28 Watt	30	Advantage 850, 5000K	48	40,000	46,000	2625	2545	82
Extra Long Life 32 Watt T8 Fluorescent Lamps											
T8 Medium Bipin Featuring ALTO II Technology											
32	28115-4	Ⓔ ●	F32T8/TL835/XLL/ALTO	30	TL 835, 3500K	48	40,000	46,000	2950	2800	84
	28116-2	Ⓔ ●	F32T8/TL841/XLL/ALTO	30	TL 841, 4100K	48	40,000	46,000	2950	2800	82
	28120-4	Ⓔ ●	F32T8/TL850/XLL/ALTO	30	TL 850, 5000K	48	40,000	46,000	2850	2700	82

For the most current product information, go to the e-catalog on **www.philips.com**

Fluorescent symbols and footnotes located on page 40

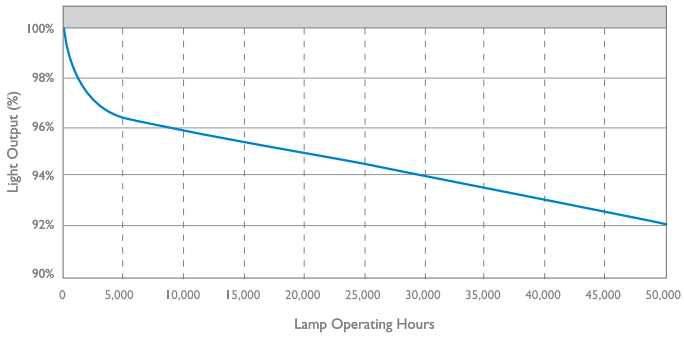
97% Lumen Maintenance

Philips Energy Advantage T8 25W and 28W XEW and XLL Lamps



95% Lumen Maintenance

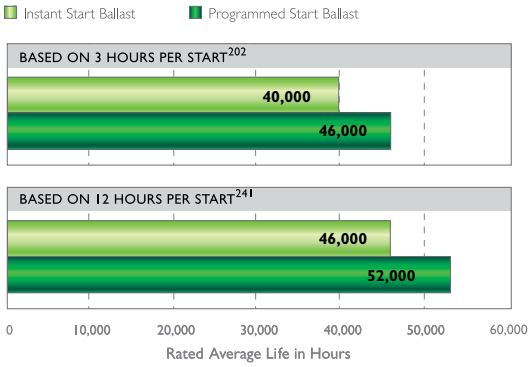
Philips T8 32W XLL Lamps





T8 Medium Bipin

Rated Average Life



Fluorescent Lamps

Advantage T8 Lamps

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208, 239)	CRI
Advantage T8 High Lumen Fluorescent Lamps											
T8 Medium Bipin Featuring ALTO II Technology											
17	28130-3	Ⓔ ●	F17T8/ADV830/ALTO	30	Advantage 830, 3000K	24	24,000	30,000	1500	1450	85
	28131-1	Ⓔ ●	F17T8/ADV835/ALTO	30	Advantage 835, 3500K	24	24,000	30,000	1500	1450	84
	28132-9	Ⓔ ●	F17T8/ADV841/ALTO	30	Advantage 841, 4100K	24	24,000	30,000	1500	1450	82
25	28140-2	Ⓔ ●	F25T8/ADV835/ALTO	30	Advantage 835, 3500K	36	24,000	30,000	2380	2300	84
	28142-8	Ⓔ ●	F25T8/ADV841/ALTO	30	Advantage 841, 4100K	36	24,000	30,000	2380	2300	82
32	28080-0	□ Ⓔ ●	F32T8/ADV830/ALTO	30	Advantage 830, 3000K	48	24,000	30,000	3100	3000	85
	28081-8	□ Ⓔ ●	F32T8/ADV835/ALTO	30	Advantage 835, 3500K	48	24,000	30,000	3100	3000	84
	28085-9	□ Ⓔ ●	F32T8/ADV841/ALTO	30	Advantage 841, 4100K	48	24,000	30,000	3100	3000	82
	28089-1	□ Ⓔ ●	F32T8/ADV850/ALTO	30	Advantage 850, 5000K	48	24,000	30,000	3000	2910	82

For the most current product information, go to the e-catalog on **www.philips.com**
Fluorescent symbols and footnotes located on page 40

Energy Savings: Two Lamp vs. Two Lamp System

Electronic Ballast	Ballast Factor	No. of Lamps	Lamp Watts	Standard T8 Lumens	Advantage T8 Lumens	System Watts	Savings
Standard T8	0.87	2	32	2850	—	58	—
Reduced Light Output T8	0.75	2	32	—	3100	51	$2.80/yr

Combine Advantage T8 lamps with reduced light output electronic ballasts, with these results:

- Saves 7 system watts vs. standard T8 system
- Saves $2.80 per fixture per year
- Energy savings based on 4000 hrs/yr @ $.10 kw/hr

Energy Savings: Two Lamp vs. Three Lamp System

Electronic Ballast	Ballast Factor	No. of Lamps	Lamp Watts	Standard T8 Lumens	Advantage T8 Lumens	System Watts	Savings
Standard T8	0.87	3	32	2850	—	88	—
Increased Light Output T8	1.20	2	32	—	3100	78	$4.00/yr

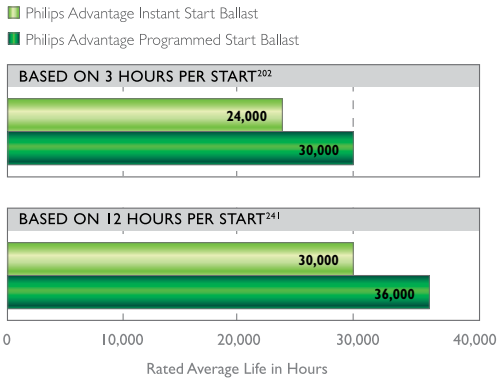
Combine advantage T8 lamps with increased light output ballasts. A two lamp advantage T8 system vs. a three lamp standard T8 system will:

- Save 10 system watts
- Save $4.00 per fixture per year
- Save energy based on 4000 hrs/yr @ $.10 kw/hr
- Reduce lighting installation costs (lamps, ballasts, fixtures and labor)
- Operate on ballast with ballast factors up to 1.32 with warranty intact



T8 Medium Bipin

Rated Average Life



Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208, 239)	CRI
PLUS 800 Series Long Life T8 Fluorescent Lamps											
T8 Medium Bipin Featuring ALTO II Technology											
17	28093-3	Ⓔ ●	F17T8/TL830/PLUS/ALTO	30	TL 830, 3000K	24	30,000	36,000	1400	1330	85
	28094-1	Ⓔ ●	F17T8/TL835/PLUS/ALTO	30	TL 835, 3500K	24	30,000	36,000	1400	1330	85
	28095-8	Ⓔ ●	F17T8/TL841/PLUS/ALTO	30	TL 841, 4100K	24	30,000	36,000	1400	1330	85
	28096-6	Ⓔ ●	F17T8/TL850/PLUS/ALTO	30	TL 850, 5000K	24	30,000	36,000	1325	1260	82
	28193-1	Ⓔ ●	F17T8/TL865/PLUS/ALTO	30	TL 865, 6500K	24	30,000	36,000	1275	1210	82
25	28097-4	Ⓔ ●	F25T8/TL830/PLUS/ALTO	30	TL 830, 3000K	36	30,000	36,000	2225	2115	85
	28098-2	Ⓔ ●	F25T8/TL835/PLUS/ALTO	30	TL 835, 3500K	36	30,000	36,000	2225	2115	85
	28099-0	Ⓔ ●	F25T8/TL841/PLUS/ALTO	30	TL 841, 4100K	36	30,000	36,000	2225	2115	85
32	28165-9	Ⓔ ●	F32T8/TL830/PLUS/ALTO	30	TL 830, 3000K	48	30,000	36,000	2950	2800	85
	28167-5	Ⓔ ●	F32T8/TL835/PLUS/ALTO	30	TL 835, 3500K	48	30,000	36,000	2950	2800	85
	28179-0	Ⓔ ●	F32T8/TL841/PLUS/ALTO	30	TL 841, 4100K	48	30,000	36,000	2950	2800	85
	20277-0	Ⓔ ●	F32T8/TL841/PLUS/ALTO	10	TL 841, 4100K, 10 PK	48	30,000	36,000	2950	2800	85
	28181-6	Ⓔ ●	F32T8/TL850/PLUS/ALTO	30	TL 850, 5000K	48	30,000	36,000	2850	2710	82
PLUS 700 Series Long Life T8 Fluorescent Lamps											
T8 Medium Bipin Featuring ALTO II Technology											
32	28182-4	●	F32T8/TL730/PLUS/ALTO	30	TL 730, 3000K	48	30,000	36,000	2800	2660	78
	28183-2	●	F32T8/TL735/PLUS/ALTO	30	TL 735, 3500K	48	30,000	36,000	2800	2660	78
	28184-0	●	F32T8/TL741/PLUS/ALTO	30	TL 741, 4100K	48	30,000	36,000	2800	2660	78
	28185-7	●	F32T8/TL750/PLUS/ALTO	30	TL 750, 5000K	48	30,000	36,000	2700	2550	78
	42306-1	●	F32T8/TL765/PLUS/ALTO	30	TL 765, 6500K	48	30,000	36,000	2750	2610	78

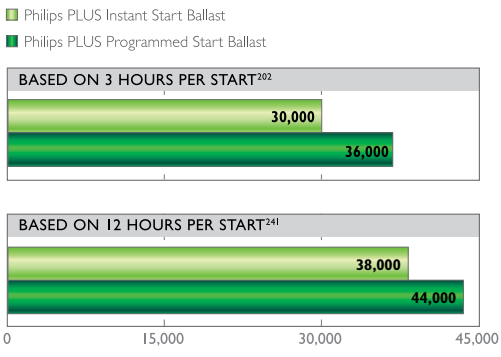
For the most current product information, go to the e-catalog on **www.philips.com**

Fluorescent symbols and footnotes located on page 40



T8 Medium Bipin

Rated Average Life



Rated Average Life in Hours

Fluorescent Lamps

800 Series T8 Lamps, 700 Series T8 Lamps

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208, 239)	CRI
800 Series T8 Fluorescent Lamps											
T8 Medium Bipin Featuring ALTO II Technology											
17	28188-1	●	F17T8/TL835/ALTO	30	TL 835, 3500K	24	24,000	30,000	1350	1280	84
	28189-9	●	F17T8/TL841/ALTO	30	TL 841, 4100K	24	24,000	30,000	1350	1280	82
	28090-9	●	F17T8/TL850/ALTO	30	TL 850, 5000K	24	24,000	30,000	1300	1235	82
25	28190-7	●	F25T8/TL835/ALTO	30	TL 835, 3500K	36	24,000	30,000	2150	2040	85
	28191-5	●	F25T8/TL841/ALTO	30	TL 841, 4100K	36	24,000	30,000	2150	2040	84
	28092-5	●	F25T8/TL850/ALTO	30	TL 850, 5000K	36	24,000	30,000	2150	2040	82
32	28151-9	● Ⓔ	F32T8/TL830/ALTO	30	TL 830, 3000K	48	24,000	30,000	2850	2710	85
	28153-5	● Ⓔ	F32T8/TL835/ALTO	30	TL 835, 3500K	48	24,000	30,000	2850	2710	84
	28155-0	● Ⓔ	F32T8/TL841/ALTO	30	TL 841, 4100K	48	24,000	30,000	2850	2710	82
	27235-1	● Ⓔ	F32T8/TL841/ALTO PLZ	1350	TL 841, 4100K	48	24,000	30,000	2850	2710	82
	28156-8	● Ⓔ	F32T8/TL850/ALTO	30	TL 850, 5000K	48	24,000	30,000	2850	2710	82
40	36834-0	●	F40T8/TL835/ALTO	25	TL 835, 3500K	60	24,000	30,000	3725	3500	84
	36847-2	●	F40T8/TL841/ALTO	25	TL 841, 4100K	60	24,000	30,000	3725	3500	82
700 Series T8 Fluorescent Lamps											
T8 Medium Bipin Featuring ALTO II Technology											
32	28162-6	●	F32T8/TL730 ALTO	30	TL 730, 3000K	48	24,000	30,000	2700	2565	78
	28161-8	●	F32T8/TL735/ALTO	30	TL 735, 3500K	48	24,000	30,000	2700	2565	78
	27259-1	●	F32T8/TL735/ALTO PLZ	1350	TL 735, 3500K	48	24,000	30,000	2700	2565	78
	28157-6	●	F32T8/TL741/ALTO	30	TL 741, 4100K	48	24,000	30,000	2700	2565	78
	38351-3	●	F32T8/TL741/ALTO	10	TL 741, 4100K, 10PK	48	24,000	30,000	2700	2565	78
	27255-9	●	F32T8/TL741/ALTO PLZ	1350	TL 741, 4100K	48	24,000	30,000	2700	2565	78
	28163-4	●	F32T8/TL750/ALTO	30	TL 750, 5000K	48	24,000	30,000	2600	2470	78

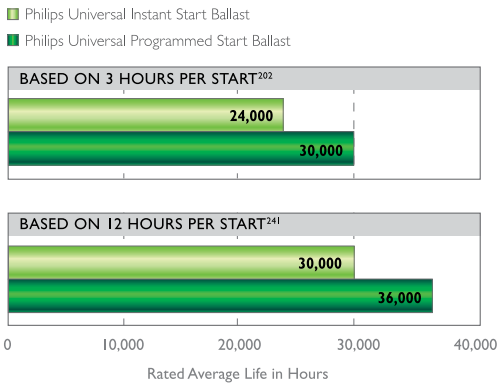
For the most current product information, go to the e-catalog on **www.philips.com**

Fluorescent symbols and footnotes located on page 40



T8 Medium Bipin

Rated Average Life



Energy Advantage U-Bent 6" T8 Fluorescent Lamps

T8 Medium Bipin with 6" Wide Spacing (212)

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
25	20420-6	●	FB32T8/ADV830/6/XEW/ALTO 25 WATT	20	TL 830, 3000K	22⅞	24,000	30,000	2400	2330	85
	20421-4	●	FB32T8/ADV835/6/XEW/ALTO 25 WATT	20	TL 835, 3500K	22⅞	24,000	30,000	2400	2330	85
	20423-0	●	FB32T8/ADV841/6/XEW/ALTO 25 WATT	20	TL 841, 4100K	22⅞	24,000	30,000	2400	2330	85
	20424-8	●	FB32T8/ADV850/6/XEW/ALTO 25 WATT	20	TL 850, 5000K	22⅞	24,000	30,000	2350	2280	82

800 Series U-Bent Rapid Start T8 Fluorescent Lamps

T8 Medium Bipin with 6" Wide Spacing (212)

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
32	37897-6	●	FB32T8/TL830/6/ALTO	20	TL 830, 3000K	22⅞	24,000	30,000	2800	2535	85
	37900-8	●	FB32T8/TL835/6/ALTO	20	TL 835, 3500K	22⅞	24,000	30,000	2800	2535	85
	37902-4	●	FB32T8/TL841/6/ALTO	20	TL 841, 4100K	22⅞	24,000	30,000	2800	2535	85
	37880-2	●	FB32T8/TL850/6/ALTO	20	TL 850, 5000K	22⅞	24,000	30,000	2700	2450	82

700 Series U-Bent Rapid Start T8 Fluorescent Lamps

T8 Medium Bipin with 6" Wide Spacing (212)

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
32	37892-7	●	FB32T8/TL730/6/ALTO	20	TL 730, 3000K	22⅞	20,000	24,000	2650	2370	78
	37893-5	●	FB32T8/TL735/6/ALTO	20	TL 735, 3500K	22⅞	20,000	24,000	2650	2370	78
	37894-3	●	FB32T8/TL741/6/ALTO	20	TL 741, 4100K	22⅞	20,000	24,000	2650	2370	78
	37882-8	●	FB32T8/TL750/6/ALTO	20	TL 750, 5000K	22⅞	20,000	24,000	2600	2325	78

Energy Advantage U-Bent 1⅝" T8 Fluorescent Lamps

T8 Medium Bipin with 1⅜" Wide Spacing (212)

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
29	22675-3	●	FB29T8/TL830/EA/ALTO	15	TL 830, 3000K	22¾	24,000	2600	2470	85
	22676-1	●	FB29T8/TL835/EA/ALTO	15	TL 835, 3500K	22¾	24,000	2600	2470	85
	22677-9	●	FB29T8/TL841/EA/ALTO	15	TL 841, 4100K	22¾	24,000	2600	2470	85

800 Series U-Bent 1⅝" T8 Fluorescent Lamps

T8 Medium Bipin with 1⅜" Wide Spacing (212)

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
31	22671-2	●	FB31T8/TL830/ALTO	15	TL 830, 3000K	22¾	24,000	2775	2636	85
	22672-0	●	FB31T8/TL835/ALTO	15	TL 835, 3500K	22¾	24,000	2775	2636	85
	22674-6	●	FB31T8/TL841/ALTO	15	TL 841, 4100K	22¾	24,000	2775	2636	85

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Fluorescent symbols and footnotes located on page 40



T8 U-Bent Lamp
Medium Bipin



T8 1⅝" U-Bent Lamp
Medium Bipin

Philips Standard and 1⅝" U-Bent T8
Warranty Period: 24 months*

Philips Energy Advantage U-Bent T8
Warranty Period: 36 months*

* Certain limitations and conditions apply.
See Philips for further warranty details.

Fluorescent Lamps

Rapid Start T8 Lamps, Preheat T8 Lamps

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
Rapid Start T8 Fluorescent Lamps											
T8 Medium Bipin; High CRI											
32	20905-6		F32T8/TL950	25	TL 950, 5000K	48	20,000	20,000	2000	1860	98
TL-D Rapid Start T8 Fluorescent Lamps—for Operation on European Ballast											
T8 Medium Bipin; High CRI											
36	29189-8		TLD36W/840NG	25	TL840, 4000K	48	20,000	—	3350	3100	82
58	29184-9		TLD58W/840NG	25	TL840, 4000K	60	20,000	—	5200	4300	82
70	29186-4		TLD70W/840NG	25	TL840, 4000K	72	20,000	—	6200	5100	82
Preheat T8 Fluorescent Lamps											
T8 Medium Bipin Linear Fluorescent Lamps; Requires Use of Starters (202)											
15	40720-5		F15T8D	25	Daylight, 6500K	18	7500	—	750	660	73
	40719-7		F15T8/CW	25	Cool White, 4100K	18	7500	—	870	765	59
	36436-4		F15T8/CW BULK	96	Cool White, 4100K	18	7500	—	850	750	59
	39226-6		F15T8/PLANT	6	Plant Lite, Sleeved	18	7500	—	410	N/A	N/A
30	28147-7	•	F30T8/CW/ALTO	25	Cool White, 4100K	36	7500	—	2200	2000	59

For the most current product information, go to the e-catalog on **www.philips.com**

Fluorescent symbols and footnotes located on page 40



T8 Medium Bipin

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
Energy Advantage T8 Slimline 8-Ft Fluorescent Lamps											
T8 Single Pin; Featuring ALTO Lamp Technology; Instant Start											
51	16321-2	▢ Ⓔ ●	F96T8/ADV835/XEW/ALTO 51W	25	TL 835, 3500K	96	24,000	30,000	5300	4940	85
	16331-1	▢ Ⓔ ●	F96T8/ADV841/XEW/ALTO 51W	25	TL 841, 4100K	96	24,000	30,000	5300	4940	85
	16457-4	▢ Ⓔ ●	F96T8/ADV850/XEW/ALTO 51W	25	TL 850, 5000K	96	24,000	30,000	5200	4840	82
PLUS Slimline T8 8-Ft Fluorescent Lamps											
T8 Single Pin; Featuring ALTO Lamp Technology; Instant Start											
59	23684-4	▢ Ⓔ ●	F96T8/TL835/PLUS/ALTO	25	TL 835, 3500K	96	24,000	30,000	5900	5490	85
	23685-1	▢ Ⓔ ●	F96T8/TL841/PLUS/ALTO	25	TL 841, 4100K	96	24,000	30,000	5900	5490	85
	23686-9	▢ Ⓔ ●	F96T8/TL850/PLUS/ALTO	25	TL 850, 5000K	96	24,000	30,000	5780	5375	82
	23681-0	▢ Ⓔ ●	F96T8/TL735/PLUS/ALTO	25	TL 735, 3500K	96	24,000	30,000	5700	5190	78
	23682-8	▢ Ⓔ ●	F96T8/TL741/PLUS/ALTO	25	TL 741, 4100K	96	24,000	30,000	5700	5190	78

For the most current product information, go to the e-catalog on **www.philips.com**
Fluorescent symbols and footnotes located on page 40

Philips XEW Slimline T8
Warranty Period: 30 months*

Philips PLUS Slimline T8
Warranty Period: 24 months*

* Certain limitations and conditions apply.
See Philips for further warranty details.

PLUS Slimline T8 8-Ft Cost of Ownership Savings

PLUS Slimline 8-foot T8 Fluorescent Lamps vs. Standard 8-foot T8 Lamps

General Overview
PLUS Slimline 8-foot T8 fluorescent lamps may provide up to 60% longer life than standard 8-foot T8 products. With an incremental cost as little as $1.00 per lamp, benefits and financial impact can be significant.

Benefits
By using PLUS Slimline 8-foot T8 lamps, the lamp replacement and labor costs are extended by an extra 2 years on a facility that operates an average of 4000 hours per year. For example, a standard 8-foot T8 product, with a rated average life expectancy of 15,000 hours, will last nearly 4 years (15,000 hours rated average life/4000 hours per year = 3¾ years). Conversely, PLUS Slimline 8-foot T8 lamps will operate for 6 years due to their rated average life expectancy of 24,000 hours (24,000 hours rated average life/4000 hours per year = 6 years).

Financial Impact
With the extended life expectancy of 2 years and the benefits of Philips exclusive TCLP-compliant low mercury technology, the positive financial impact of installing PLUS Slimline 8-foot T8 lamps may provide cost of ownership savings per lamp as follows:

Incremental Cost	$ (1.00)
Material Cost Avoidance [A]	$ 4.00
Labor Cost Avoidance [B]	$ 3.72
Disposal Cost Avoidance [C]	$ 0.72
Cost of Ownership Savings	**$ 7.44**

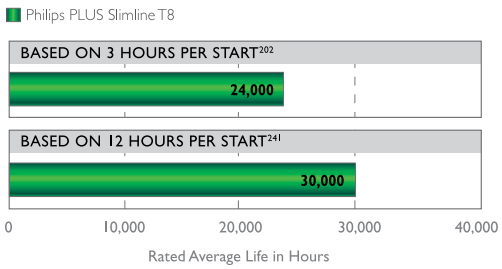
A Material Cost Avoidance is the annualized acquisition cost per lamp (average cost per lamp of $7.50 for standard 8-Foot T8 product / 3 3/4 years = $2.00 per year). By installing PLUS Slimline 8-Foot T8 lamps, a material cost per lamp of $4.00 is avoided due to the extra 2 years of life expectancy. Note that the average cost per lamp may vary.

B Labor Cost Avoidance is the annualized labor replacement cost per lamp (labor replacement cost per lamp of $7.00 / 3 years = $1.86 per year). By installing PLUS Slimline 8-Foot T8 lamps, a labor replacement cost per lamp of $3.72 is avoided due to the extra 2 years life expectancy. Note that the labor replacement cost per lamp may vary.

C Disposal Cost Avoidance is based on an average of $.09 per foot for lamp recycling or $.72 per 8-foot lamp. Philips Lighting Company encourages the recycling of all fluorescent lamps.


T8 Single Pin

Rated Average Life



Fluorescent Lamps

High Output T8 Lamps, U-Bent T12 Lamps, Rapid Start T12 Lamps

PLUS High Output (HO) T8 8-Foot Fluorescent Lamps

T8 Recessed D.C.; Featuring ALTO Lamp Technology, Use on proper Programmed Start Ballasts Only*

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
86	23687-7	□ Ⓔ ●	F96T8/TL835/HO/PLUS/ALTO	25	TL 835, 3500K	96	24,000	30,000	8200	7625	85
	23688-5	□ Ⓔ ●	F96T8/TL841/HO/PLUS/ALTO	25	TL 841, 4100K	96	24,000	30,000	8200	7625	85
	23689-3	□ Ⓔ ●	F96T8/TL850/HO/PLUS/ALTO	25	TL 850 5000K	96	24,000	30,000	8100	7550	82

* Per ANSI C78.81, this lamp is designed for programmed start operation with high frequency operating currents of 400mA (nominally) to achieve the rated lumens and life

High Output (HO) T8 Fluorescent Lamps—4 foot

T8 Recessed D.C.; Featuring ALTO Lamp Technology, Use on proper Programmed Start Ballasts Only*

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
44	23679-4	□ ●	F48T8/TL841/HO/ALTO	25	TL 841, 4100K	48	18,000	4000	3600	85

* Per ANSI C78.81, this lamp is designed for programmed start operation with high frequency operating currents of 400mA (nominally) to achieve the rated lumens and life

U-Bent T12 Fluorescent Lamps

T12 Medium Bipin

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
40	42309-5		FB40/T12/NX/6	12	Neutral Deluxe, 3500K	22⅞	18,000	2300	1955	90
	42308-7		FB40/T12/CWSupreme/6	12	Cool White Supreme, 4100K	22⅞	18,000	2300	1955	90
	21993-1		FB40/DX/6	12	Daylight Deluxe, 6500K	22⅞	18,000	2250	1950	90

Rapid Start T12 Fluorescent Lamps

T12 Medium Bipin

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
30	37649-1	●	F30T12/D/RS/ALTO	30	Daylight, 6500K	36	18,000	1950	1700	73
	27242-7	●	F30T12/CW/RS/ALTO	30	Cool White, 4100K	36	18,000	2250	1900	59
	13221-7	●	F30T12/WW/RS/ALTO	30	Warm White, 3000K	36	18,000	2300	1950	49
40	42318-6		F40T12/NX/ALTO	30	Neutral Deluxe, 3500K	48	20,000	2550	2200	88
	42388-9		F40T12/CWSupreme/ALTO	30	Cool White Supreme, 4100K	48	20,000	2600	2250	89
	42312-9		F40T12/CWSupreme/PLUS/ALTO	30	Cool White Supreme, 4100K	48	24,000	2550	2220	89
	42389-7		F40T12/C50Supreme/ALTO	30	Color Tone 50 Supreme, 5000K	48	20,000	2500	2175	90
	27359-9		F40/DX/ALTO	30	Daylight Deluxe, 6500K	48	20,000	2325	2025	90
	39228-2		F40/PLANT	6	Plant Light, Sleeved	48	20,000	1600	1360	—

For the most current product information, go to the e-catalog on **www.philips.com**
Fluorescent symbols and footnotes located on page 40



T8 Recessed DC



T12 Medium Bipin



T12 U-Bent
Medium Bipin

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
Preheat T12 Fluorescent Lamps										
T12 Medium Bipin Linear Fluorescent Lamps										
14	14151-5		F14T12/CW	30	Cool White, 4100K	15	9000	710	590	59
15	14149-9		F15T12/CW 30PK	30	Cool White, 4100K	18	9000	800	695	62
20	27328-4	●	F20T12/D/ALTO	30	Daylight, 6500K	24	9000	960	960	73
	27332-6	●	F20T12/CW/ALTO	30	Cool White, 4100K	24	9000	1200	1050	59
	27349-0	●	F20T12/WW/ALTO	30	Warm White, 3000K	24	9000	1250	1100	49
	39227-4		F20T12/PLANT	6	Plant Lite, Sleeved	24	9000	600	500	—
Slimline T12 Fluorescent Lamps										
T12 Single Pin Linear Fluorescent Lamps; Instant Start										
39	36219-4	●	F48T12/D/ALTO	15	Daylight, 6500K	48	9000	2500	2220	73
	36321-8		F48T12/CW ALTO 15PK	15	Cool White, 4100K	48	9000	2950	2600	62
56	36985-0	●	F72T12/D/ALTO	15	Daylight, 6500K	72	12,000	3800	3350	73
	36989-2	●	F72T12/CW/ALTO	15	Cool White, 4100K	72	12,000	4450	3900	59
75	42305-3		F96T12/NX/ALTO	15	Neutral Deluxe, 3500K	96	12,000	5000	4250	88
	42319-4		F96T12/CWSupreme/ALTO	15	Cool White Supreme, 4100K	96	12,000	5000	4250	89
	42387-1		F96T12/C50Supreme/ALTO	15	Color Tone 50 Supreme, 5000K	96	12,000	5000	4350	90
	37282-1	●	F96T12/DX/ALTO	15	Daylight Deluxe, 6500K	96	12,000	4775	4200	90
High Output T12 Fluorescent Lamps (800ma)										
T12 Recessed D.C. Linear Fluorescent Lamps (207, 214)										
35	14145-7		F24T12/CW/HO	30	Cool White, 4100K	24	9000	1650	1390	59
40	14142-4		F30T12/CW/HO	30	Cool White, 4100K	30	9000	2290	1900	59
50	14138-2		F36T12/D/HO	30	Daylight, 6500K	36	9000	2500	2150	73
	14139-0		F36T12/CW/HO	30	Cool White, 4100K	36	9000	2800	2450	59
55	14137-4		F42T12/CW/HO	30	Cool White, 4100K	42	9000	3400	2950	59
60	36984-3	●	F48T12/D/HO/ALTO	15	Daylight, 6500K	48	12,000	3400	3000	73
	36978-5	●	F48T12/CW/HO/ALTO	15	Cool White, 4100K	48	12,000	4050	3500	59
80	35578-4		F64T12/CW/HO	15	Cool White, 4100K	64	12,000	5600	4850	62
85	36653-4	●	F72T12/D/HO/ALTO	15	Daylight, 6500K	72	12,000	5600	4850	73
	36651-8	●	F72T12/CW/HO/ALTO	15	Cool White, 4100K	72	12,000	6350	5500	59
High Output T12 Fluorescent Lamps (800ma)										
T12 Recessed D.C. Linear Fluorescent Lamps (207, 214)										
110	21489-0	●	F96T12/DX/HO	15	Daylight Deluxe, 6500K	96	12,000	6750	5800	90
High Output T12 800 Series Fluorescent Lamps (800ma)										
T12 Recessed D.C. Linear Fluorescent Lamps; For Low Temperature Applications (223)										
110	38177-4	●	F96T12/D/HO-O/ALTO	15	Daylight, 6500K	96	12,000	7800	6800	73
	38176-4	●	F96T12/CW/HO-O/ALTO	15	Cool White, 4100K	96	12,000	8800	7650	59

For the most current product information, go to the e-catalog on **www.philips.com**

Fluorescent symbols and footnotes located on page 40



T12 Medium Bipin



T12 Single Pin



T12 Recessed DC

Fluorescent Lamps

Very High Output T12, Gold Fluorescent, Appliance, T9 Circline Lamps

Very High Output T12 Fluorescent Lamps (1500ma)

T12 Recessed D.C. Linear Fluorescent Lamps (214)

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Average Life 3 Hr. Start (202)	Rated Average Life 12 Hr. Start (241)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
110	21819-8		F48T12/CW/VHO	15	Cool White, 4100K	48	12,000	12,000	7050	4950	59
185	34232-9		F96T12/CW/VHO/EW	15	Cool White, 4100K	96	12,000	12,000	13,000	9000	59
215	34234-5		F96T12/CW/VHO	15	Cool White, 4100K	96	12,000	12,000	15,200	10,700	59

Gold Fluorescent Lamps

Blocks UV Emissions

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
32	42531-4		F32T8/GOLD PLUS	30	Gold Sleeved	48	24,000	1750	1480	—
40	43100-7		F40T12/GOLD	30	Gold Sleeved	48	20,000	1700	1465	—

Appliance Fluorescent Lamps

T8 Medium Bipin Linear Fluorescent Lamps; For use with Starters

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
18	23690-1		F18T8/CW/24	24	Cool White, 4100K	24	7500	1175	940	59

Circline Fluorescent Lamps

T9 4-Pin Circular Fluorescent Lamps

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
20	24982-1		FC6T9/COOL WHITE PLUS	12	Cool White, 4100K	6½ OD	12,000	800	590	59
22	39222-5		FC8T9/SOFT WHITE	12	3000K	8 OD	12,000	1150	875	85
	39235-7		FC8T9/DAYDLX	12	6500K	8 OD	12,000	910	675	79
	39116-9		FC8T9/COOL WHITE PLUS	12	Cool White, 4100K	8 OD	12,000	1050	775	59
32	39122-7		FC12T9/SOFT WHITE	12	3000K	12 OD	12,000	1900	1600	85
	26260-0		FC12T9/D	12	Daylight, 6500K	12 OD	12,000	1570	1300	73
	39117-7		FC12T9/COOL WHITE PLUS	12	Cool White, 4100K	12 OD	12,000	1800	1500	59
40	39118-5		FC16T9/COOL WHITE PLUS	12	Cool White, 4100K	16 OD	12,000	2500	1975	59

For the most current product information, go to the e-catalog on **www.philips.com**

Fluorescent symbols and footnotes located on page 40



T12 Recessed DC



GOLD Lamp



T8 Medium Bipin



T9 4-Pin Circular

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Color Temp. (K)	Nom. Length (In.)	Rated Avg. Life (Hrs.)(241)	Approx. Initial Lumens (203,204)	CRI	Availability
TuffGuard T5 Fluorescent Coated Lamps										
T5 Miniature Bipin Linear Fluorescent Lamps										
14	16690-0	●	F14T5/830/ALTO TG	40	3000	22	35,000	1350	85	Made to Order
21	16669-4	●	F21T5/841/ALTO TG	40	4100	34	35,000	2100	85	Made to Order
28	16417-8	●	F28T5/835/ALTO TG	40	3500	46	35,000	2900	85	Stocked
	16674-4	●	F28T5/841/ALTO TG	40	4100	46	35,000	2900	85	Stocked
44	42058-8	Ⓔ ●	F54T5/835/HO/XEW/ALTO 44W TG	40	3500	46	35,000	4520	85	Made to Order
	42059-6	Ⓔ ●	F54T5/841/HO/XEW/ALTO 44W TG	40	4100	46	35,000	4520	85	Made to Order
	42060-4	Ⓔ ●	F54T5/850/HO/XEW/ALTO 44W TG	40	5000	46	35,000	4400	82	Made to Order
49	16961-5	●	F54T5/841/HO/EA/ALTO 49W TG	40	4100	46	35,000	5000	85	Stocked
	40900-3	●	F54T5/850/HO/EA/ALTO 49W TG	40	5000	46	35,000	4850	82	Stocked
54	16672-8	●	F54T5/835/HO/ALTO TG	40	3500	46	35,000	5000	85	Stocked
	16298-2	●	F54T5/841/HO/ALTO TG	40	4100	46	35,000	5000	85	Stocked
	16686-8	●	F54T5/850/HO/ALTO TG	40	5000	46	35,000	5000	82	Stocked
TuffGuard T8 Fluorescent Coated Lamps										
T8 Medium Bipin Linear Fluorescent Lamps										
25	28288-9	●	F25T8/TL830/PLUS/ALTO TG	30	3000	36	36,000	2225	85	Stocked
	28289-7	●	F25T8/TL835/PLUS/ALTO TG	30	3500	36	36,000	2225	85	Stocked
	28290-5	●	F25T8/TL841/PLUS/ALTO TG	30	4100	36	36,000	2225	85	Stocked
28	28319-2	●	F32T8/ADV830/EW/ALTO 28W TG	30	3000	48	36,000	2725	85	Stocked
32	28329-1	●	F32T8/ADV850/ALTO TG	30	5000	48	30,000	3000	82	Made to Order
	28312-7	●	F32T8/ADV850/XEW/ALTO TG	30	5000	48	30,000	2400	82	Made to Order
	28330-9	●	F32T8/TL730/ALTO TG	30	3,000	48	30,000	2700	78	Made to Order
	28331-7	●	F32T8/TL735/ALTO TG	30	3500	48	30,000	2700	78	Stocked
	28332-5	●	F32T8/TL741/ALTO TG	30	4100	48	30,000	2700	78	Stocked
	28333-3	●	F32T8/TL750/ALTO TG	30	5000	48	30,000	2600	78	Made to Order
	28335-8	●	F32T8/TL835/ALTO TG	30	3500	48	30,000	2850	85	Stocked
	28336-6	●	F32T8/TL841/ALTO TG	30	4100	48	30,000	2850	85	Made to Order
	28337-4	●	F32T8/TL850/ALTO TG	30	5000	48	30,000	2850	82	Made to Order
	28339-0	●	F32T8/ADV841/ALTO TG	30	4100	48	30,000	3150	85	Stocked
	28342-4	●	F32T8/TL741/PLUS/ALTO TG	30	4100	48	36,000	2800	78	Stocked
	28343-2	●	F32T8/TL750/PLUS/ALTO TG	30	5000	48	36,000	2700	78	Stocked
	28345-7	●	F32T8/TL835/PLUS/ALTO TG	30	3500	48	36,000	2950	85	Stocked
	28303-6	●	F32T8/TL841/XLL/ALTO TG	30	4100	48	40,000	2950	85	Stocked
	28346-5	●	F32T8/TL841/PLUS/ALTO TG	30	4100	48	36,000	2950	85	Stocked
	28347-3	●	F32T8/TL850/PLUS/ALTO TG	30	5000	48	36,000	2850	82	Stocked
	42304-6	●	F32T8/TL765/PLUS/ALTO TG	30	6500	48	36,000	2750	78	Made To Order
44	40905-2	●	F48T8/TL841/HO/ALTO TG	25	4100	48	18,000	4000	85	Made to Order
59	40907-8	●	F96T8/TL741/PLUS/ALTO TG	25	4100	96	30,000	5700	78	Made to Order
	40909-4	●	F96T8/TL841/PLUS/ALTO TG	25	4100	96	30,000	5900	85	Made to Order
86	40912-8	●	F96T8/TL841/HO/PLUS/ALTO TG	25	4100	96	30,000	8200	85	Stocked

Note: Made to order products require a 3 week lead time.
For the most current product information, go to the e-catalog on **www.philips.com**
Fluorescent symbols and footnotes located on page 40



T5 Miniature Bipin



T8 Medium Bipin

Fluorescent Lamps

TuffGuard Lamps

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Color Temp. (K)	Nom. Length (In.)	Rated Avg. Life (Hrs.)(202)	Approx. Initial Lumens (203,204)	CRI	Availability
TuffGuard T12 Fluorescent Coated Lamps										
39	16307-1	●	F48T12/D/ALTO TG	15	6500	48	9000	2500	73	Stocked
40	42310-3	●	F40T12/NX/ALTO TG	30	3500	48	20,000	2550	88	Made To Order
	42400-2	●	F40T12/CWSUPREME/ALTO TG	30	4100	48	20,000	2600	89	Made To Order
	42399-5	●	F40T12/C50 SUPREME/ALTO/TG	30	5000	48	20,000	2500	90	Made To Order
	16299-0	●	F40DX/ALTO TG	30	6500	48	20,000	2325	90	Stocked
60	16296-6	●	F48T12/CW/HO/ALTO TG	15	4100	48	12,000	4050	59	Stocked
75	42317-8	●	F96T12/NX/ALTO TG	15	3500	96	12,000	5000	88	Made To Order
	42316-0	●	F96T12/CWSUPREME/ALTO TG	15	4100	96	12,000	5000	89	Made To Order
	42401-0	●	F96T12/C50 SUPREME/ALTO/TG	15	5000	96	12,000	5000	90	Made To Order
	16297-4	●	F96T12/DX/ALTO/TG	15	6500	96	12,000	4500	90	Stocked
110	16301-4	●	F96T12/CW/HO-O/ALTO TG	15	4100	96	12,000	8800	59	Stocked
	16302-2	●	F96T12/D/HO-O/ALTO TG	15	6500	96	12,000	7800	73	Stocked

Note: Made to order products require a 3 week lead time.
For the most current product information, go to the e-catalog on **www.philips.com**
Fluorescent symbols and footnotes located on page 40



T12 Medium Bipin



T12
Single Pin



T12
Recessed DC Bay

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
T5 Fluorescent Lamps										
Blister-Carded Linear Fluorescent Lamps; Miniature Bipin										
4	39218-3		F4T5/SOFT WHITE	12/1	3000K	6	6000	150	120	85
6	39219-1		F6T5/SOFT WHITE	12/1	3000K	9	7500	325	260	85
8	39220-9		F8T5/SOFT WHITE	12/1	3000K	12	7500	450	360	85
	39114-4		F8T5/COOL WHITE PLUS	12/1	4100K	12	7500	400	300	59
	15756-0		F8T5/BLB UPC	25/1	—	12	7500	—	—	—
13	39221-7		F13T5/SOFT WHITE	12/1	3000K	21	7500	1000	800	85
	40974-8		F13T5/Cool White	12/1	4100K	21	7500	820	660	59
T5 Fluorescent Lamps										
28	20613-6	●	F28T5/TL835 ALTO UPC 15/1	15	TL835, 3500K	46	20,000	2900	2750	85
	40963-1	●	F28T5/TL841 ALTO UPC 15/1	15	TL841, 4100K	46	25,000	2900	2750	85

For the most current product information, go to the e-catalog on **www.philips.com**
Fluorescent symbols and footnotes located on page 40



T5 Miniature Bipin

Fluorescent Lamps

Consumer Lamps

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
T8 Fluorescent Lamps										
Medium Bipin & Single Pin Linear Fluorescent Lamps										
15	39212-6	●	F15T8/Soft White	1	3000K Individually Sleeved	18	7500	1000	900	85
	39207-6	●	F15T8/Cool White Plus	1	4100K Individually Sleeved	18	7500	870	765	59
	39108-6	●	F15T8/Cool White Plus	1	4100K Individually Sleeved	24	7500	1175	1035	59
	39226-6		F15T8/Plant	1	Individually Sleeved	18	7500	410	—	—
	15760-2		F15T8/Blacklight	6/1	Individually Sleeved	18	7500	—	—	—
17	28126-1	●	F17T8/Soft White UPC	30	3000K 30 Pk Case	24	20,000	1400	1300	85
30	39216-7	●	F30T8/Soft White	6/1	3000K Individually Sleeved	36	7500	2500	2250	85
	28145-1	●	F30T8/CW ALTO UPC	30	4100K Individually Sleeved	36	7500	2200	1760	59
32	40943-3	●	F32T8/SOFT WHITE ALTO	10	3000K 10 Pk Case	48	24,000	2950	2800	85
	40968-0	●	F32T8/TL735/ALTO 15/2	15/2	3500K 2 Pk	48	24,000	2700	2565	78
	20545-0	●	F32T8/TL735 ALTO 10PK	10	3500K 10 Pk Case	48	24,000	2700	2565	78
	40944-1	●	F32T8/TL741/ALTO TG	10	Safety Coated 4100K 10 Pk	48	24,000	2700	2565	78
	38351-3	●	F32T8/TL741 ALTO 10PK	10	4100K 10 Pk Case	48	24,000	2700	2565	78
	15238-9	●	F32T8/ADV841/XEW/ALTO 25W	10	4100K 10 Pk Case	48	30,000	2500	2425	85
	20278-8	●	F32T8/TL841/XLL/ALTO 10PK	10	4100K 10 Pk Case	48	36,000	2950	2800	85
	20504-7	●	F32T8/TL850 ALTO 10PK	10	5000K 10 Pk Case	48	24,000	2850	2710	82
	42294-9	●	F32T8/Daylight Deluxe/ALTO 1/10	10	6500K 10 Pk Case	48	30,000	2750	2600	78
	28200-4	●	F32T8/TL735/ALTO	30	3500K 30 Pk Case	48	24,000	2700	2565	78
	28197-2	●	F32T8/TL741/ALTO	30	4100K 30 Pk Case	48	24,000	2700	2565	78
	28199-8	●	F32T8/TL850/ALTO	30	5000K 30 Pk Case	48	24,000	2850	2710	82
	42295-5	●	F32T8/Daylight Deluxe/ALTO 1/30	30	6500K 30 Pk Case	48	30,000	2750	2600	78
	40966-4	●	F32T8/TL850/ALTO	15/2	5000K 2 Pk	48	24,000	2850	2710	82
	22682-9	●	F32T8/SOFT WHITE /ALTO 36/2	36/2	3000K 2 Pk	48	24,000	2950	2800	84
	22679-5		F32T8/COOL WHITE PLUS 36/2	36/2	4100K 2 Pk	48	24,000	2800	2660	78
	42296-3	●	F32T8/Daylight Deluxe/ALTO 36/2	36/2	6500K 2 Pk	48	30,000	2750	2600	78

For the most current product information, go to the e-catalog on **www.philips.com**

Fluorescent symbols and footnotes located on page 40



T8 Medium Bipin T8 Single Pin

T12 Fluorescent Lamps

Medium Bipin, Single Pin and High Output

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
14	14150-7		F14T12/SOFT WHITE	6/1	3000K Individually Sleeved	15	9000	700	560	85
15	14146-5		F15T12/SOFT WHITE	6/1	3000K Individually Sleeved	18	9000	800	720	85
20	39120-1	●	F20T12/SOFT WHITE	6/1	3000K Individually Sleeved	24	9000	1350	1215	85
	39230-8		F20T12/NATURAL SUNSHINE	6/1	5000K Individually Sleeved	24	9000	850	755	92
	39227-4		F20T12/PLANT	6/1	Individually Sleeved	24	9000	600	—	—
	15761-0		F20T12/BLACKLIGHT	6/1	Individually Sleeved	24	9000	—	—	—
	40945-8	●	F20T12/CW/ALTO	10	4100K 10 Pk Case	24	9000	1200	1050	59
	38693-8	●	F20T12/SPEC 35 UPC	30	3500K 30 Pk Case	24	9000	1200	1050	75
	20550-0	●	F20T12/CW/ALTO 15/2	15/2	4100K 2 Pk	24	9000	1200	1050	59
	20554-2	●	F20T12/D/ALTO 15/2	15/2	6500K 2 Pk	24	9000	1075	960	73
30	39215-9	●	F30T12/SOFT WHITE	6/1	3000K Individually Sleeved	36	18,000	2400	2160	85
	40937-5	●	F30T12/DAYLIGHT DELUXE/ALTO	6/1	6500K Individually Sleeved	36	18,000	1950	1700	90
	38694-6	●	F30T12/SPEC 35 UPC	30	3500K 30 Pk Case	36	18,000	2350	2080	73
40	39228-2		F40T12/PLANT	6/1	Individually Sleeved	48	20,000	1600	—	—
	15762-8	●	F40T12/BLACKLIGHT	6/1	Individually Sleeved	48	20,000	—	—	—
	42275-8	●	F40T12/SOFT WHITE DX/ALTO 1/10	1/10	Soft White Deluxe, 3000K	48	20,000	2600	2260	88
	42276-6	●	F40T12/SOFT WHITE DX/ALTO 15/2	15/2	Soft White Deluxe, 3000K	48	20,000	2600	2260	88
	42272-5	●	F40T12/NEUTRAL DX/ALTO 1/10	1/10	Neutral Deluxe, 3500K	48	20,000	2600	2260	88
	42273-3	●	F40T12/NEUTRAL DX/ALTO 1/30	1/30	Neutral Deluxe, 3500K	48	20,000	2550	2200	88
	42274-1	●	F40T12/NEUTRAL DX/ALTO 15/2	15/2	Neutral Deluxe, 3500K	48	20,000	2550	2200	88
	42267-5	●	F40T12/CWSUPREME/ALTO 1/10	1/10	Cool White Supreme, 4100K	48	20,000	2600	2250	89
	42270-9	●	F40T12/CWSUPREME/ALTO 1/30	1/30	Cool White Supreme, 4100K	48	20,000	2600	2250	89
	42281-6	●	F40T12/CWSUPREME/ALTO 36/2	36/2	Cool White Supreme, 4100K	48	20,000	2600	2250	89
	42283-2	●	F40T12/CWSUPREME/PLUS/ALTO 1/10	1/10	Cool White Supreme, 4100K	48	24,000	2550	2220	89
	42285-7	●	F40T12/CWSUPREME/PLUS/ALTO 15/2	15/2	Cool White Supreme, 4100K	48	24,000	2550	2220	89
	42396-1	●	F40T12/C50 NATURAL SUPREME 1/10	10	Natural Light, 5000K	48	20,000	2500	2250	92
	42395-3	●	F40T12/C50 NATURAL SUPREME 1/30	30	Natural Light, 5000K	48	20,000	2500	2250	92
	42397-9	●	F40T12/C50 NATURAL SUPREME 15/2	15/2	Natural Light, 5000K	48	20,000	2500	2250	92
	38752-2	●	F40T12/DAYDLX	10	6500K 10 Pk	48	20,000	2325	2025	90
	22683-7	●	F40T12/DAYDELUX ALTO 36/2PK	36/2	6500K 2 Pk	48	20,000	2325	2025	90
	40938-3	●	F40T12/DAYLIGHT DELUXE/ALTO	30	6500K 30 Pk Case	48	20,000	2325	2025	90
56	36999-1	●	F72T12/CW/ALTO UPC	15	4100K 15 Pk Case	72	12,000	4450	3900	59
60	36982-7	●	F48T12/CW/HO/UPC	15	4100K 15 Pk Case	48	12,000	4050	3500	59
75	37663-2	●	F96T12/DAYDLX/ ALTO 8/2PK	8/2	6500K 2 PK	96	12,000	4775	4200	90
	42279-0	●	F96T12/NX/ALTO 8/2	8/2	Neutral Deluxe, 3500K	96	12,000	5000	4250	88
	42277-4	●	F96T12/CWSupreme/ALTO 1/15	1/15	Cool White Supreme, 4100K	96	12,000	5000	4250	89
	42278-2	●	F96T12/CWSupreme/ALTO 8/2	8/2	Cool White Supreme, 4100K	96	12,000	5000	4250	89
	42398-7	●	F96T12/C50 Natural Supreme 8/2	8/2	Natural Light, 5000K	96	12,000	4800	4350	90
110	38176-4	●	F96T12/CW/HO-O/ALTO	15	Cool White, 4100K 15 Pk	96	12,000	8800	7650	59
	20544-3	●	F96T12/CW/HO-O/ALTO	8/2	4100K 2 Pk	96	12,000	8800	7650	59

For the most current product information, go to the e-catalog on **www.philips.com**

Fluorescent symbols and footnotes located on page 40



T12 Medium Bipin T12 Single Pin T12 Recessed DC

Fluorescent Lamps

Consumer Lamps

Watts	Product Number	Symbols, Footnotes	Ordering Code	Pkg. Qty.	Description	Nom. Length (In.)	Rated Avg. Life (Hrs.) (202)	Approx. Initial Lumens (203,204)	Design Lumens (208)	CRI
Circline Fluorescent Lamps										
T9 Circular 4-Pin Fluorescent Lamps										
22	39222-5		FC8T9/SOFT WHITE	12/1	3000K Individually Sleeved	8 OD	12,000	1150	875	85
	39116-9		FC8T9/COOL WHITE PLUS	12/1	4100K Individually Sleeved	8 OD	12,000	1050	775	59
	39235-7		FC8T9/DAYDLX	12/1	6500K Individually Sleeved	8 OD	12,000	910	675	79
32	39122-7		FC12T9/SOFT WHITE	12/1	3000K Individually Sleeved	12 OD	12,000	1900	1600	85
	39117-7		FC12T9/COOL WHITE PLUS	12/1	4100K Individually Sleeved	12 OD	12,000	1800	1500	59
	26260-0		FC12T9/DAYLIGHT DELUXE	12/1	6500K Individually Sleeved	13 OD	12,000	1570	1300	79
40	39118-5		FC16T9/COOL WHITE PLUS	6/1	4100K Individually Sleeved	16 OD	12,000	2500	1975	59
U-Bent T8										
T8 Medium Bipin										
32	20549-2	•	FB32T8/TL735/6/ALTO UPC 10/1	1	TL70, 3500K Individually Sleeved	22⅞	20,000	2650	2370	78
	20548-4	•	FB32T8/TL741/6/ALTO UPC 10/1	1	TL70, 4100K Individually Sleeved	22⅞	20,000	2650	2370	78
Rapid Start U-Bent T12										
T12 Medium Bipin										
40	42280-8		FB40/T12/CWSupreme/6 UPC 12/1	12/1	Cool White Supreme, 4100K	22⅞	18,000	2300	1955	90
	42282-4		FB40/T12/Neutral DX/6 UPC 12/1	12/1	Neutral Deluxe, 3500K	22⅞	18,000	2300	1955	90
	21993-1		FB40DX/6	12/1	Daylight Deluxe, 6500K	22⅞	18,000	2250	1950	90

For the most current product information, go to the e-catalog on **www.philips.com**
Fluorescent symbols and footnotes located on page 40



T9 4-Pin Circular

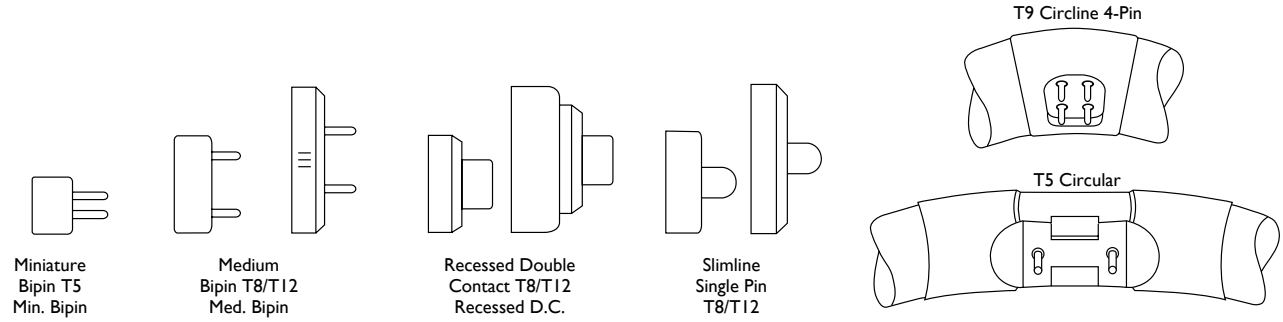


T8 U-Bent



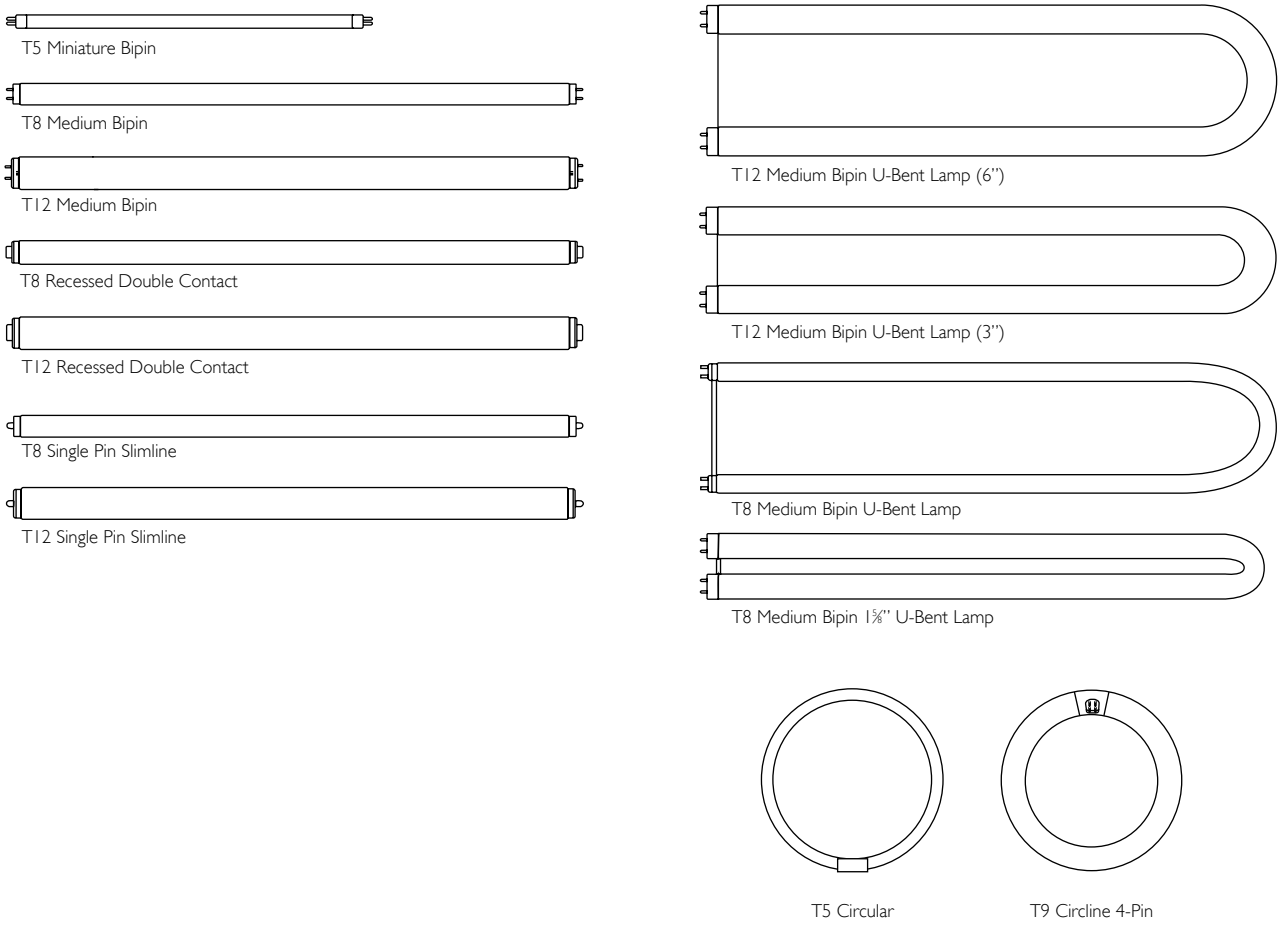
T12 U-Bent
Medium Bipin

Base Types (Not Actual Sizes)



Bulb Shapes (Not Actual Sizes)

The size and shape of a bulb is designated by a letter or letters followed by a number. The letter indicates the shape of the bulb, while the number indicates the diameter of the bulb in eighths of an inch. For example, "T12" indicates a tubular shaped bulb having a diameter of 12⁄8 or 1 1⁄2 inches. The following illustrations show some of the more popular bulb shapes and sizes.



Fluorescent Lamps

Symbols and Footnotes

For the most current product information, go to the e-catalog on www.philips.com

□ Exclusive to Philips Lighting Company

● This lamp is better for the environment because of its reduced mercury content. All Philips ALTO lamps give you end-of-life options, which can simplify and reduce your lamp disposal costs, depending on your state and local regulations. ALTO II Lamps have only 1.7mg of mercury.

Ⓔ This Bulb Meets US Federal Minimum Efficiency Standard. Philips designs and manufactures fluorescent lamps to the following lighting industry standard: NEMA Standard LSD 26—Measurement Methods and Performance Tolerances for Verification Testing of General Purpose Incandescent and Fluorescent Lamps

(202) Average life under specified test conditions with lamps turned off and restarted no more frequently than once every 3 operating hours. Lamp life is appreciably longer if lamps are started less frequently. Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not.

(203) Approximate initial lumens. The lamp lumen output is based upon lamp performance after 100 hours of operating life, when the output is measured during operation on a reference ballast under standard laboratory conditions.

(204) For expected lamp lumen output, commercial ballast manufacturers can advise the appropriate ballast factor for each of their ballasts when they are informed of the designated lamp. The ballast factor is a multiplier applied to the designated lamp lumen output.

(207) Approximate initial lumens are for 800 ma. operation. For 1000 ma. operation, lumens are approximately 10% higher and watts approximately 15% higher.

(208) Design lumens are the approximate lamp lumen output at 40% of the lamp's rated average life. This output is based upon measurements obtained during lamp operation on a reference ballast under standard laboratory conditions.

(212) Nominal length measured from face of base to maximum distant outside point of U. Measurement does not include base pins. Leg spacing center to center approximately 6", for /6 and 3⅝" for /3 lamps.

(214) Econ-o-watt lamps are only recommended for use on high power factor lead, indoor ballasts that meet ANSI standards. The lamps are not recommended for use in drafty areas, or locations where the ambient temperature is less than 60°F, except as noted. Also they should not be operated on low power factor ballasts, reduced light or reduced current ballasts, dimming ballasts or emergency system inverter ballasts.

(223) Meets the National Energy Policy Act of 1992 exemption for outdoor or cold temperature applications only.

(226) T5 nominal lamp lengths are shorter than standard sizes. See chart on page 27 for details.

(239) Design lumens rated at 3 hours per start on Instant Start ballast.

(241) Average life under engineering data with lamps turned off and restarted once every 12 operating hours. Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not.

Philips	GE	OSI
F15T8/CW/24/ALTO	F24"T8/CW/4	F18T8/CW/K/24
F16T8/CW/26	F26"T8/CW/4	F18T8/CW/K/26
F17T8/CW/28	F28"T8/CW/4	F18T8/CW/K/28
F18T8/CW/30	F30"T8/CW/4	F18T8/CW/K/30
F20T12/CW/ALTO (6PK)	F20T12/CW (6 Pack)	F20T12/CW/6
F25T12/CW	F25T12/CW/33	F25T12/CW/33
F30T12/CW/RS/EW/ALTO	F30T12/CW/RS/WM	F30T12/CW/RS/SS

TL 70	Trimline	Octron
F17T8/TL741/ALTO	F17T8/SP41/RS	FO17/741
F25T8/TL741/ALTO	F25T8/SP41/RS	FO25/741
F32T8/TL741/ALTO	F32T8/SP41/RS	FO32/741
F40T8/TL741/ALTO	F40T8/SP41/RS	FO40/741
F96T8/TL741/ALTO	F96T8/SP41	FO96T8/741
FB32T8/TL741/ALTO	F32T8/SP41/U/6	FB032/741/6

TL 80		
F17T8/TL841/ALTO	F17T8/SPX41	FO17/841
F25T8/TL841/ALTO	F25T8/SPX41	FO25/841
F32T8/TL841/ALTO	F32T8/SPX41	FO32/841
F40T8/TL841/ALTO	F40T8/SPX41	FO40/841
F96T8/TL841/ALTO	F96T8/SPX41	FO96/841
FB32T8/TL841/ALTO	F32T8/SPX41/U/6	FBO32/841/6

Long Life	XL EXTRA-LIFE	XP
F17T8/TL841/PLUS/ALTO	F17T8/XL/SPX41/ECO	FO17/841/XP/ECO
F25T8/TL841/PLUS/ALTO	F25T8/XL/SPX41/ECO	FO25/841/XP/ECO
F32T8/TL841/PLUS/ALTO	F32T8/XL/SPX41/ECO	FO32/841/XP/ECO

Energy Savings	WATTMISER/ULTRAMAX	SS
F32T8/ADV841/EW/ALTO 30 Watt	F32T8/XL/SP41/WM/ECO	FO30/841/XP/SS/ECO
F32T8/ADV841/EW/ALTO 28 Watt	F28T8/XL/SP41/WM/ECO	FO28/841/XP/SS/ECO
F32T8/ADV841/XEW/ALTO 25 Watt	NA	NA
F40CW/RS/EW/ALTO	F40CW/RS/WM	F40CW/RS/SS
F40LW/RS/EW/ALTO	F40LW/RS/WM	F40LW/RS/SS
F40T12/841/ALTO	F40/SP41	F40/D41
F40T12/ADV41/ALTO	F40/SPX41	F40/D841
F96T12/CW/EW/ALTO	F96T12/CW/WM	F96T12/CW/SS
F96T12/CW/HO/EW/ALTO	F96T12/CW/HO/WM	F96T12/CW/HO/SS
F96T12/CW/HO-O/ALTO	F96T12/CW/HO/CT	F96T12/CW/HO/COLD TEMP
F96T12/CW/VHO/EW/ALTO	F96PG17/CW/WM	F96T12/CW/VHO/SS
FB40CW/6/EW/ALTO	F40CW/U/6/WM	FB40CW/6/SS
F48T12/CW/VHO	F48T12/CW/1500	F48T12/CW/VHO
F72T12/CW/VHO	F72T12/CW/1500	F72T12/CW/VHO
F96T12/CW/VHO	F96T12/CW/1500	F96T12/CW/VHO
F48T12/CW/VHO-O	F48T12/CW/1500/0	F48T12/CW/VHO/LT
F60T12/CW/VHO-O	F60T10/CW	—
F72T12/CW/VHO-O	F72T12/CW/1500/0	F72T12/CW/VHO/LT
F96T12/CW/VHO-O	F96T12/CW/1500/0	F96T12/CW/VHO/LT

Fluorescent Lamps
Cross Reference Guide

Color Cross Reference Guide

Philips	GE	OSI
SPEC		
SPEC 30 or 730	SP 30	D 30
SPEC 35 or 735	SP 35	D 35
SPEC 41 or 741	SP 41	D 41
Ultralume	**Designer 800**	
27 or 27U	SPX 27	27K
30U or 830	SPX 30	D 830
35U or 835	SPX 35	D 835
41U or 841	SPX 41	D 841
C50	C50	DSGN50

Light Source Color Chart

Fluorescent Color	Color Abbreviation	Atmosphere	Light Output (%) In 4' Lamp	CCT	CRI	CIE Color Coordinates X	Y
Cool White	CW	Cool	100	4100K	62	0.38	0.38
Deluxe Cool White	CWX	Cool	72	4100K	89	0.376	0.367
Daylight	D	Cool Daylight	85	6500K	79	0.313	0.337
Daylight Deluxe	DX	Cool Daylight	76	6500K	84	0.314	0.341
Lite White	LW	Cool	104	4200K	51	0.376	0.386
Natural	N	Neutral	69	3700K	90	0.384	0.357
3000K, SPEC30	SPEC30	Warm	105	3000K	70	0.444	0.409
3500K, SPEC35	SPEC35	Neutral	105	3500K	73	0.41	0.395
4100K, SPEC41	SPEC41	Cool	105	4100K	70	0.382	0.385
Advantage T12 30	ADV30	Warm	118	3000K	82	0.444	0.409
Advantage T12 35	ADV35	Neutral	118	3500K	82	0.41	0.395
Advantage T12 41	ADV41	Cool	118	4100K	82	0.382	0.385
Advantage T12 50	ADV50	Daylight	118	5000K	82	0.346	0.36
Warm White	WW	Warm	102	3000K	53	0.44	0.403
Colortone 50	C50	Daylight	72	5000K	92	0.345	0.359
Colortone 75	C75	Daylight Plus	66	7500K	95	0.299	0.316
3000K, Ultralume	30U	Warm	108	3000K	85	0.444	0.409
3500K, Ultralume	35U	Neutral	108	3500K	85	0.413	0.395
4100K, Ultralume	41U	Cool	108	4100K	85	0.382	0.385
5000K, Ultralume	50U	Daylight	93	5000K	85	0.346	0.356
3000K, TL 70	TL730	Warm	93	3000K	78	0.439	0.402
3500K, TL 70	TL735	Neutral	93	3500K	78	0.41	0.395
4100K, TL 70	TL741	Cool	93	4100K	78	0.382	0.385
5000K, TL 70	TL750	Daylight	90	5000K	76	0.346	0.356
3000K, TL 80	TL830	Warm	98	3000K	86	0.439	0.402
3500K, TL 80	TL835	Neutral	98	3500K	86	0.41	0.395
4100K, TL 80	TL841	Cool	98	4100K	86	0.382	0.385
5000K, TL 80	TL850	Daylight	97	5000K	86	0.346	0.356
3000K, TL 90	TL930	Warm	66	3000K	95	0.438	0.399
5000K, TL 90	TL950	Daylight	66	5000K	98	0.344	0.355
Advantage T8 830	ADV830	Warm	105	3000K	86	0.444	0.409
Advantage T8 835	ADV835	Neutral	105	3500K	86	0.41	0.395
Advantage T8 841	ADV841	Cool	105	4100K	86	0.382	0.385
Advantage T8 850	ADV850	Daylight	105	5000K	86	0.346	0.36

Residential Applications Light Source Color Chart

Fluorescent Color	Light Output Atmosphere	Light Output (%) In 4' Lamp	CCT	CRI	Lighted Appearance CIE Color Coordinates X	Y
Cool White Plus	Cool	105	4100K	62-70	0.382	0.385
Natural Sunshine	Daylight	72	5000K	92	0.345	0.359
Soft White	Warm	108	3000K	85	0.444	0.409

Correlated Color Temperature, CCT, describes the apparent color, or chromaticity, of a light source. Fluorescent light sources of 3000K, for example, Warm White or 3000K Ultralume, have a warm chromaticity, while 5000K lamps such as Colortone® 50 or 5000K Ultralume have a higher blue content and are considered to be cooler in color.

Color Rendering Index, CRI, is a relative value that indicates the color rendering quality of illumination provided by a light source. The higher the index number, the better the quality of illumination. While one lamp may have the same apparent color in CCT as another, its ability to render colors properly may be more or less than another light source. For example, Warm White 3000K 53 CRI lamps will not render colors of objects in an illuminated space as well as 3000K Ultralume 85 CRI lamps.

Both CCT and CRI should be cited together when properly describing light source color attributes.

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Switching from incandescent to compact fluorescent lamps can significantly lower energy consumption and operating costs.

Better for your business, better for the environment

Philips EnergySaver compact fluorescent bulbs can help reduce your electricity bill and save energy, while helping you create a relaxing, inviting atmosphere. From table lamps and recessed lighting to decorative fixtures, compact fluorescents are available in the shapes and sizes you are accustomed to.

Selecting the right type

There are 2 types of CFL bulbs; one with an integrated ballast (CFLi) and one without an integrated ballast (CFLni).Both types provide energy efficiency and long life. The integrated CFLi bulbs are a direct replacement for traditional incandescent bulbs, fitting into most standard fixtures. The non-integrated CFLni bulbs offer designers, specifiers and end users versatility in configurations, size, and application possibilities.

Current Product	Philips Upgrade Product	Benefit	Page
65W BR30 Incandescent	EnergySaver 16W R30 Dimmable	• Smooth dimming curve • Compatible with many household dimmer switches[1]	48
60W A19 Incandescent	EnergySaver T2 Twister 13W	• Small size mini twister fits more fixtures • 10,000–12,000 hours rated average life	46
40W PL-L	Energy Advantage PL-L 25W	• 95% lumen maintenance • 20% energy savings (when compared to a PL-L 40W)* • Only 1.4mg of mercury	56

Actual lumen values may vary

1) For compatible dimmers, please see: http://www.usa.lighting.philips.com/connect/tools_literature/compatibility.wpd

* On Instant Start Ballast, a standard PL-L 40W only draws 32 Watts, so the actual savings is 7 Watts (32W - 25W = 7W). 40W - 32W = 8W / 40 = 20%

Compact Fluorescent Lamps

EnergySaver Twisters

Watts	Inc. Equiv. Watts	Bulb	Base	Product Number	Symbols, Footnotes	Description	Ordering Code	Pkg. Type	Case Qty.	MOL (In.)	Diam. (In.)	Rated Avg. Life (Hrs.) (230)	CRI	Brightness (Lumens) (231)	Life (Yrs.) (446)	Energy Cost (445)	Light Appear. (CCT)
EnergySaver T2 Mini Twister														**FTC REQUIREMENTS¥**			
9	40	T2 Twister	Med.	41398-8	■	Mini Twister Soft White	EL/mdT 9W T2	Box	6	3⅜	2	12,000	82	550	11.0	$1.08	2700
13	60	T2 Twister	Med.	41399-6	■	Mini Twister Soft White	EL/mdT2 13W	Box	6	3¾	2	12,000	82	900	11.0	$1.57	2700
				41402-9	■	Mini Twister White Light	EL/mdT2 13W 3.5K	Box	6	3¾	2	10,000	82	840	9.1	$1.57	3500
				41403-7	■	Mini Twister Cool White	EL/mdT2 13W 4.1K	Box	6	3¾	2	10,000	82	840	9.1	$1.57	4100
				41404-5	■	Mini Twister Bright White	EL/mdT2 13W 5K	Box	6	3¾	2	10,000	82	810	9.1	$1.57	5000
18	75	T2 Twister	Med.	41400-3	■	Mini Twister Soft White	EL/mdT2 18W	Box	6	4½	2¼	12,000	82	1300	11.0	$2.17	2700
23	100	T2 Twister	Med.	41401-1	■	Mini Twister Soft White	EL/mdT2 23W	Box	6	4½	2¼	12,000	82	1600	11.0	$2.77	2700
				41405-2	■	Mini Twister White Light	EL/mdT2 23W 3.5K	Box	6	4½	2¼	10,000	82	1600	9.1	$2.77	3500
				41406-0	■	Mini Twister Cool White	EL/mdT2 23W 4.1K	Box	6	4½	2¼	10,000	82	1600	9.1	$2.77	4100
				41407-8	■	Mini Twister Bright White	EL/mdT2 23W 5K	Box	6	4½	2¼	10,000	82	1500	9.1	$2.77	5000
26	100	T2 Twister	Med.	41410-2	■	Mini Twister Soft White	EL/mdT2 26W	Box	6	5⅜	2	12,000	82	1800	11.0	$3.13	2700
				41408-6	■	Mini Twister Cool White	EL/mdT2 26W 4.1K	Box	6	5⅜	2	10,000	82	1800	9.1	$3.13	4100
				41409-4	■	Mini Twister Bright White	EL/mdT2 26W 5K	Box	6	5⅜	2	10,000	82	1700	9.1	$3.13	5000
EnergySaver Twister																	
5	25	Twister	Med.	14792-6		Twister Soft White	EL/mdT 5W	Box	6	3⅜	1⅝	10,000	82	250	9.1	$0.60	2700
32	125	Twister	Med.	15639-8	■	Twister Soft White	EL/mdT 32W	Box	6	5⅜	2⅝	12,000	82	2200	11.0	$3.85	2700
				42470-5	■ †	Twister Soft White	EL/mdT 32W 3K	Box	6	5⅜	2⅝	10,000	82	2200	9.1	$3.85	3000
42	150	Twister	Med.	13948-5	■	Twister Soft White	EL/dT42W	Box	6	6⅜	2⅝	12,000	82	2800	11.0	$5.06	2700
				42752-6	†	Twister Soft White	EL/dT 42W 3K	Box	6	6⅜	2⅝	10,000	82	2800	9.1	$5.06	3000
65	300	Twister	Med.	43176-7	†	Twister Soft White	EL/dT 65W	Box	6	6⅜	8⅔	10,000	82	2800	9.1	$7.83	2700
				43234-4	†	Twister Cool White	EL/dT 65W 4.1K	Box	6	6⅜	8⅔	10,000	82	2800	9.1	$7.83	4100

For the most current product information, go to the e-catalog on **www.philips.com**

Compact fluorescent symbols and footnotes located on page 59



Compact Fluorescent Lamps

EnergySaver Twisters, A-Shape Lamps

Watts	Inc. Equiv. Watts	Bulb	Base	Product Number	Symbols, Footnotes	Description	Ordering Code	Pkg. Type	Case Qty.	MOL (In.)	Diam. (In.)	Rated Avg. Life (Hrs.) (230)	CRI	Brightness (Lumens) (231)	Life (Yrs.) (446)	Energy Cost (445)	Light Appear. (CCT)
EnergySaver Twister Dimmable																FTC REQUIREMENTS¥	
15	60	Twist. Dim	Med.	42002-6	■ †	Twister Dim Soft White	EL/mdT 15W 1% Dim	Box	6	4⅔	2⅛	10,000	82	950	9.1	$1.81	2700
20	75	Twist. Dim	Med.	42003-4	■ †	Twister Dim Soft White	EL/mdT 20W 1% Dim	Box	6	4⅞	2⅜	10,000	82	1250	9.1	$2.41	2700
32	125	Twist. Dim	Med.	40715-5	■ **X**	Twister Dim Soft White	EL/dT DIM 32W	Box	6	6⅛	2¾	10,000	82	2100	9.1	$3.85	2700
EnergySaver Twister GU24																	
13	60	Twist.	GU24	41723-8	■	Twister GU24 Soft White	EL/mdT 13W GU24	Box	6	3⅜	1⅝	10,000	82	900	9.1	$1.57	2700
		GU24		41138-9	■	Twister GU24 Cool White	EL/mdT 13W GU24 4.1K	Box	6	3⅜	1⅝	10,000	82	900	9.1	$1.57	4100
18	75	Twist.	GU24	41724-6	■	Twister GU24 Soft White	EL/mdT 18W GU24	Box	6	3⅜	2⅛	10,000	82	1250	9.1	$2.17	2700
		GU24		41177-7	■	Twister GU24 Cool White	EL/mdT 18W GU24 4.1K	Box	6	3⅜	2⅛	10,000	82	1250	9.1	$2.17	4100
23	100	Twist.	GU24	41725-3	■	Twister GU24 Soft White	EL/mdT 23W GU24	Box	6	4⅜	2⅝	10,000	82	1600	9.1	$2.77	2700
		GU24		41139-7	■	Twister GU24 Cool White	EL/mdT 23W GU24 4.1K	Box	6	4⅜	2⅝	10,000	82	1600	9.1	$2.77	4100
EnergySaver Twister 3-Way																	
11	50	Twister	Med.	21193-8	■	Twist. 3-Way	EL/3W 11-23-34	Clam	6	6⅝	2⅜	10,000	82	700	9.1	$1.32	2700
23	100					Double Helix								1500		$2.77	
34	150													2200		$4.09	
EnergySaver A-Shape																	
9	40	A19	Med.	41736-0	■	A19 Soft White	EL/A SWP 9W	Box	6	4⅜	2⅛	8000	82	450	7.3	$1.08	2700
14	60	A19	Med.	41737-8	■	A19 Soft White	EL/A SWP 14W	Box	6	4⅜	2⅜	8000	82	800	7.3	$1.69	2700
20	75	A21	Med.	20080-8	■	A21 Soft White	EL/A SWP 20W	Box	6	5⅜	2⅜	8000	82	1100	7.3	$2.41	2700

For the most current product information, go to the e-catalog on **www.philips.com**

Compact fluorescent symbols and footnotes located on page 59



15W Twister Dimmable Med.

20W Twister Dimmable Med.

32W Twister Dimmable Med.

GU24 Twister GU24

3-Way Twister Med.

A-Shape SWP Med.

Compact Fluorescent Lamps

EnergySaver Reflectors

Watts	Inc. Equiv. Watts	Bulb	Base	Product Number	Symbols, Footnotes	Description	Ordering Code	Pkg. Type	Case Qty.	MOL (In.)	Diam. (In.)	Rated Avg. Life (Hrs.) (230)	CRI	Brightness (Lumens) (231)	Life (Yrs.) (446)	Energy Cost (445)	Light Appear. (CCT)
EnergySaver Reflector														**FTC REQUIREMENTS¥**			
13	50	R20	Med.	42682-5	■ †	R20 Soft White	EL/A R20 13W	Box	6	4⅞	2½	8000	82	470	7.3	$1.57	2700
				42753-4	†	R20 Soft White	EL/A R20 13W 3K	Box	6	4⅞	2½	8000	82	470	7.3	$1.57	3000
15	75	R30	Med.	15703-2	■	R30 Soft White	EL/A R30 15W	Box	6	5⅜	3⅝	8000	82	750	7.3	$1.81	2700
				40620-7	■	R30 Soft White	EL/A R30 15W	Box	4	5⅜	3⅝	8000	82	750	7.3	$1.81	2700
				40621-5	■	R30 Soft White	EL/A R30 15W 2PK	Box	4	5⅜	3⅝	8000	82	750	7.3	$1.81	2700
				41863-2	■	R30 Soft White	BC-EL/A 15W R30	Clam	2	5⅜	3⅝	8000	82	750	7.3	$1.81	2700
				41862-4	■	R30 Cool White	EL/A R30 15W 4.1K	Box	6	5⅜	3⅝	8000	82	750	7.3	$1.81	4100
23	120	R40	Med.	15702-4	■	R40 Soft White	EL/A R40 23W	Box	6	6½	4⅞	8000	82	1250	7.3	$2.77	2700
				42120-6	■	R40 Soft White	BC-EL/A R40 23W	Clam	2	6½	4⅞	8000	82	1250	7.3	$2.77	2700
	90	PAR38	Med.	41995-1	■	PAR38 Soft White	EL/A PAR38 23W	Box	6	6½	4⅞	8000	82	1300	7.3	$2.77	2700
				41678-4	■	PAR38 Soft White	BC-EL/A PAR38 23W	Clam	2	6½	4⅞	8000	82	1300	7.3	$2.77	2700
		Hard PAR38	Med.	15716-4	■	PAR38 2pc Soft White	EL/A PAR38 23W 2pc	Box	6	5⅞	4⅛	8000	82	1300	7.3	$2.77	2700
				22791-8	■	PAR38 2pc Soft White	EL/A PAR38 23W 2pc	Box	4	5⅞	4⅛	8000	82	1300	7.3	$2.77	2700
				40892-2	■	PAR38 2pc Soft White	EL/A PAR38 23W 2pc 2pk	Box	4	5⅞	4⅛	8000	82	1300	7.3	$2.77	2700
EnergySaver Dimmable Reflector																	
16	65	R30 DIM	Med.	41997-7	■ †	R30 Dimm. Soft White	EL/A R30 EDIM 16W	Box	6	5⅜	3⅝	8000	82	630	7.3	$1.93	2700
20	75	R40 DIM	Med.	41999-3	■ †	R40 Dimm. Soft White	EL/A R40 EDIM 20W	Box	6	6	4⅞	8000	82	900	7.3	$2.41	2700
		PAR38 DIM	Med.	42001-8	■ †	PAR38 Dimm. Soft White	EL/A PAR38 EDIM 20W	Box	6	6	4⅞	8000	82	850	7.3	$2.41	2700

For the most current product information, go to the e-catalog on **www.philips.com**

Compact fluorescent symbols and footnotes located on page 59



R20
Med.



R30
Med.



R40
Med.



PAR38
Med.



Hard Glass PAR38
Med.

Compact Fluorescent Lamps

EnergySaver Decoratives

Watts	Inc. Equiv. Watts	Bulb	Base	Product Number	Symbols, Footnotes	Description	Ordering Code	Pkg. Type	Case Qty.	MOL (In.)	Diam. (In.)	Rated Avg. Life (Hrs.) (230)	CRI	Brightness (Lumens) (231)	Life (Yrs.) (446)	Energy Cost (445)	Light Appear. (CCT)
														FTC REQUIREMENTS*			
EnergySaver Fan																	
5	25	Fan	Med.	41747-7		Fan Soft White	EL/A FAN 5W	Box	6	3⅜	1⅔	8000	82	250	7.3	$0.60	2700
EnergySaver Candle																	
5	25	mCan	Cand.	42230-3	■	Candle Soft White	EL/mCan T2 5W	Box	6	4½	1⅜	8000	82	215	7.3	$0.60	2700
		Can	Med.	42229-5	■	Candle Soft White	EL/Can T2 5W	Box	6	4⅞	1⅜	8000	82	215	7.3	$0.60	2700
9	40	mCan	Cand.	41741-0	■	Candle Soft White	EL/mCan T2 9W	Box	6	4⅜	1⅔	8000	82	410	7.3	$1.08	2700
		Can	Med.	41744-4	■	Candle Soft White	EL/Can T2 9W	Box	6	4¾	1⅔	8000	82	410	7.3	$1.08	2700
EnergySaver Globe																	
9	40	G25	Med.	41735-2	■	G25 Globe Soft White	EL/A G25 T3 9W	Box	6	4⅜	3⅛	8000	82	500	7.3	$1.08	2700
14	60	G25	Med.	42787-2	■	G25 Globe Soft White	EL/A G25 14W	Box	6	5½	5½	8000	82	800	7.3	$1.68	2700
16	60	G30	Med.	21106-0	■	G30 Globe Soft White	EL/A G30 16W	Box	6	5½	5½	8000	82	900	7.3	$1.93	2700
23	75	G40	Med.	21107-8	■	G40 Globe Soft White	EL/A G40 23W	Box	6	6⅛	6	8000	82	1400	7.3	$2.77	2700

For the most current product information, go to the e-catalog on **www.philips.com**

Compact fluorescent symbols and footnotes located on page 59



Compact Fluorescent Lamps

EnergySaver Outdoor, Universal, TuffGuard Lamps

Watts	Inc. Equiv. Watts	Bulb	Base	Product Number	Symbols, Footnotes	Description	Ordering Code	Pkg. Type	Case Qty.	MOL (In.)	Diam. (In.)	Rated Avg. Life (Hrs.) (230)	CRI	Brightness (Lumens) (231)	Life (Yrs.) (446)	Energy Cost (445)	Light Appear. (CCT)
														FTC REQUIREMENTS¥			
EnergySaver Outdoor																	
14	60	T16	Med.	40778-3	■	Prismatic Postlight	EL/O 14W Prisma	Box	6	5 7/10	2	8000	82	840	7.3	$1.69	2700
EnergySaver Universal																	
14	60	SLS	Med.	14691-0	● ■	SLS Universal Triple Tube	SLS 14W	Box	6	5	2 1/2	12,000	82	860	11.0	$1.69	2700
20	75	SLS	Med.	13077-3	●	SLS Universal Triple Tube	SLS 20W	Box	6	5 5/8	2 1/2	15,000	82	1200	11.0	$2.41	2700
25	100	SLS	Med.	13574-9	●	SLS Universal Triple Tube	SLS 25W	Box	6	6 1/2	2 1/2	15,000	82	1750	11.0	$3.01	2700
EnergySaver TuffGuard																	
18	75	T20	Med.	13578-0	■ X	TuffGuard	EL/O 18W	Box	6	6	2 3/4	15,000	82	1100	9.1	$2.17	2700

For the most current product information, go to the e-catalog on **www.philips.com**

Compact fluorescent symbols and footnotes located on page 59



T16 Postlight Med.



14W SLS Universal Med.



20W SLS Universal Med.



25W SLS Universal Med.



18W TuffGuard T20 Med.

Compact Fluorescent Lamps

EnergySaver Decoratives

Watts	Inc. Equiv. Watts	Bulb	Base	Product Number	Symbols, Footnotes	Description	Ordering Code	Pkg. Type	Case Qty.	MOL (In.)	Diam. (In.)	Rated Avg. Life (Hrs.) (230)	CRI	Brightness (Lumens) (231)	Life (Yrs.) (446)	Energy Cost (445)	Light Appear. (CCT)
EnergySaver Silicone A-Shape														FTC REQUIREMENTS*			
9	40	A17	Med.	41504-2	■ †	A17 Silicone Soft White	EL/A T2 SC 9W 6/2	Clam	6	4⅛	2⅛	8000	82	450	7.3	$1.08	2700
14	60	A17	Med.	41503-4	■ †	A17 Silicone Soft White	EL/A T2 SC 14W 6/2	Clam	6	4⅛	2⅛	8000	82	800	7.3	$1.69	2700

For the most current product information, go to the e-catalog on **www.philips.com**

Compact fluorescent symbols and footnotes located on page 59



Compact Fluorescent Lamps

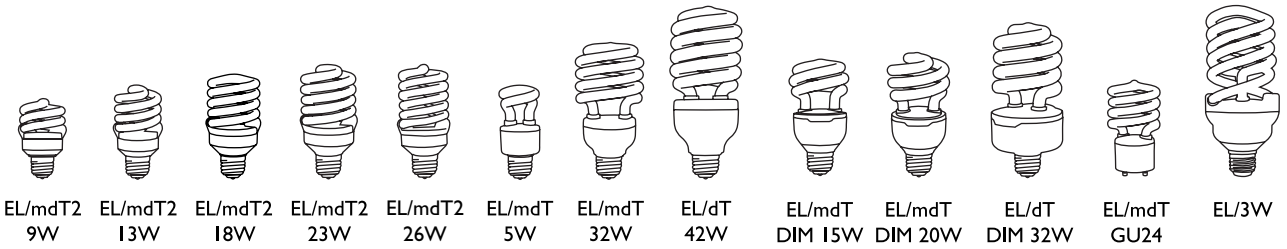
EnergySaver Base Types and Bulb Shapes

EnergySaver Compact Fluorescent Base Types (Not Actual Sizes)

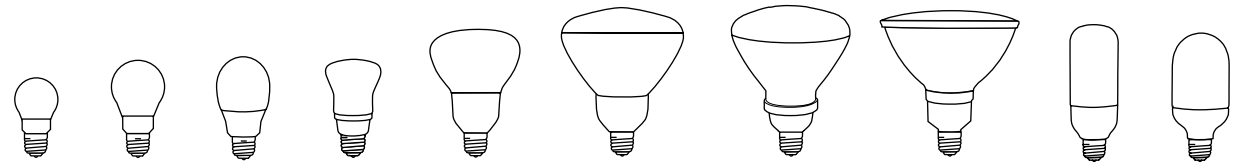


Med. Medium | Cand. Candelabra | GU24

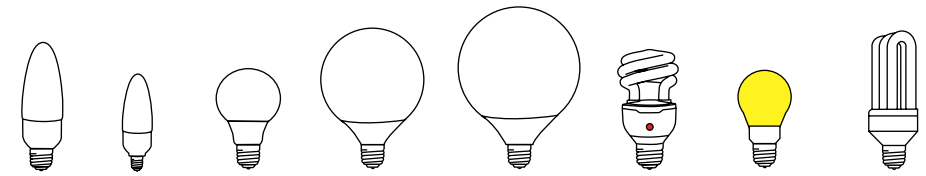
EnergySaver Compact Fluorescent Bulb Shapes (Not Actual Sizes)



EL/mdT2 9W | EL/mdT2 13W | EL/mdT2 18W | EL/mdT2 23W | EL/mdT2 26W | EL/mdT 5W | EL/mdT 32W | EL/dT 42W | EL/mdT DIM 15W | EL/mdT DIM 20W | EL/dT DIM 32W | EL/mdT GU24 | EL/3W



EL/A FAN | EL/A SWP | A17 | EL/A R20 | EL/A R30 | EL/A R40 | EL/A PAR38 | EL/A PAR38 2PC | T16 | T20



EL/Can | EL/mCan | EL/A G25 | EL/A G30 | EL/A G40 | EL/mdT D2D 14W | EL/A SWP BAW | SLS EL/T

Compact Fluorescent Lamps

PL-S and PL-C Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Description	Generic Designation	Pkg. Qty.	MOL (In.)	Rated Avg. Life (Hrs.) (230)	Design Lumens (208)	CRI	Brightness (Lumens) (231)	Life (Yrs.) (446)	Energy Cost (445)	Light Appear. (CCT)
												FTC REQUIREMENTS¥			
PL-S (Short) Fluorescent Lamps															
5	PL-S	G23	14671-2	•	PL-S 5W/827/2P/ALTO	CFT5W/G23/827	10	4 9/32	10,000	210	82	250	9.1	$0.60	2700
			14868-4	•	PL-S 5W/841/2P/ALTO	CFT5W/G23/841	10	4 9/32	10,000	210	82	250	9.1	$0.60	4100
7	PL-S	G23	14871-8	•	PL-S 7W/827/2P/ALTO	CFT7W/G23/827	10	5 11/32	10,000	360	82	400	9.1	$0.84	2700
			14872-6	•	PL-S 7W/835/2P/ALTO	CFT7W/G23/835	10	5 11/32	10,000	360	82	400	9.1	$0.84	3500
			14873-4	•	PL-S 7W/841/2P/ALTO	CFT7W/G23/841	10	5 11/32	10,000	360	82	400	9.1	$0.84	4100
9	PL-S	G23	14867-6	•	PL-S 9W/827/2P/ALTO	CFT9W/G23/827	10	6 13/32	10,000	540	82	600	9.1	$1.08	2700
			14869-2	•	PL-S 9W/835/2P/ALTO	CFT9W/G23/835	10	6 13/32	10,000	540	82	600	9.1	$1.08	3500
			14870-0	•	PL-S 9W/841/2P/ALTO	CFT9W/G23/841	10	6 13/32	10,000	540	82	600	9.1	$1.08	4100
13	PL-S	GX23	14681-1	•	PL-S 13W/827/2P/ALTO	CFT13W/GX23/827	10	7 1/64	10,000	740	82	825	9.1	$1.57	2700
			14683-7	•	PL-S 13W/830/2P/ALTO	CFT13W/GX23/830	10	7 1/64	10,000	740	82	825	9.1	$1.57	3000
			14684-5	•	PL-S 13W/835/2P/ALTO	CFT13W/GX23/835	10	7 1/64	10,000	740	82	825	9.1	$1.57	3500
			14685-2	•	PL-S 13W/841/2P/ALTO	CFT13W/GX23/841	10	7 1/64	10,000	740	82	825	9.1	$1.57	4100
			14687-8	•	PL-S 13W/850/2P/ALTO	CFT13W/GX23/850	10	7 1/64	10,000	720	82	825	9.1	$1.57	5000
			14688-6	•	PL-S 13W/850/2P/ALTO/BULK	CFT13W/GX23/850	50	7 1/64	10,000	720	82	825	9.1	$1.57	5000
PL-C (Cluster) 2-Pin—Energy Advantage															
21	PL-C	G24d-3	40976-3	†	PL-C 26W/830/XEW/ ALTO 21W	CFQ26W/G24d/830	10	6 3/16	10,000	1375	82	1600	9.1	$2.53	3000
			40977-1	†	PL-C 26W/835/XEW/ ALTO 21W	CFQ26W/G24d/835	10	6 3/16	10,000	1375	82	1600	9.1	$2.53	3500
PL-C (Cluster) 2-Pin															
13	PL-C	GX23-2	38310-9	•	PL-C 13W/827/USA/ALTO	CFQ13W/GX23/827	10	4 5/8	10,000	735	82	860	9.1	$1.57	2700
			38311-7	•	PL-C 13W/830/USA/ALTO	CFQ13W/GX23/830	10	4 5/8	10,000	735	82	860	9.1	$1.57	3000
			38312-5	•	PL-C 13W/835/USA/ALTO	CFQ13W/GX23/835	10	4 5/8	10,000	735	82	860	9.1	$1.57	3500
			38313-3	•	PL-C 13W/841/USA/ALTO	CFQ13W/GX23/841	10	4 5/8	10,000	735	82	860	9.1	$1.57	4100
		G24d-1	38314-1	•	PL-C 13W/827/ALTO	CFQ13W/G24d/827	10	5 1/2	10,000	770	82	900	9.1	$1.57	2700
18	PL-C	G24d-2	38316-6	•	PL-C 18W/827/ALTO	CFQ18W/G24d/827	10	6	10,000	1070	82	1250	9.1	$2.17	2700
			38317-4	•	PL-C 18W/830/ALTO	CFQ18W/G24d/830	10	6	10,000	1070	82	1250	9.1	$2.17	3000
			38318-2	•	PL-C 18W/835/ALTO	CFQ18W/G24d/835	10	6	10,000	1070	82	1250	9.1	$2.17	3500
			38319-0	•	PL-C 18W/841/ALTO	CFQ18W/G24d/841	10	6	10,000	1070	82	1250	9.1	$2.17	4100
26	PL-C	G24d-3	38321-6	•	PL-C 26W/827/ALTO	CFQ26W/G24d/827	10	6 3/16	10,000	1545	82	1800	9.1	$3.13	2700
			38322-4	•	PL-C 26W/830/ALTO	CFQ26W/G24d/830	10	6 3/16	10,000	1545	82	1800	9.1	$3.13	3000
			38323-2	•	PL-C 26W/835/ALTO	CFQ26W/G24d/835	10	6 3/16	10,000	1545	82	1800	9.1	$3.13	3500
			38324-0	•	PL-C 26W/841/ALTO	CFQ26W/G24d/841	10	6 3/16	10,000	1545	82	1800	9.1	$3.13	4100
PL-C (Cluster) 2-Pin, 15mm Tube Diameter															
20	PL-C	GX32d-2	24168-7		PL-C 15mm/22W/827	CFQ20W/GX32d/827	40	6	10,000	995	82	1200	9.1	$2.41	2700
27	PL-C	GX32d-3	24169-5		PL-C 15mm/28W/827	CFQ27W/GX32d/827	40	6 3/16	10,000	1325	82	1600	9.1	$3.25	2700

For the most current product information, go to the e-catalog on **www.philips.com**

Compact fluorescent symbols and footnotes located on page 59

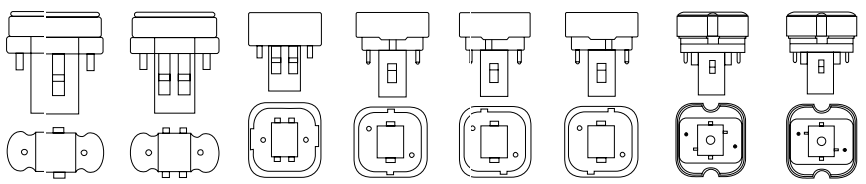
Philips PL-S

Warranty Period: 12 months*

* Certain limitations and conditions apply. See Philips for further warranty details.



PL-S G23 | PL-S GX23 | PL-C 2-Pin Energy Advantage | PL-C 2-Pin 15mm



PL-S G23 Base | PL-S GX23 Base | PL-C 2-Pin GX23-2 Base | PL-C 2-Pin G24d-1 Base | PL-C 2-Pin G24d-2 Base | PL-C 2-Pin G24d-3 Base | PL-C 2-Pin GX32d-2 Base | PL-C 2-Pin GX32d-3 Base

Compact Fluorescent Lamps

PL-C Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Description	Generic Designation	Pkg. Qty.	MOL (In.)	Rated Avg. Life (Hrs.) (230)	Design Lumens (208)	CRI	Brightness (Lumens) (231)	Life (Yrs.) (446)	Energy Cost (445)	Light Appear. (CCT)
PL-C (Cluster) 4-Pin, Energy Advantage													FTC REQUIREMENTS¥		
14	PL-C	G24q-2	22034-3	•	PL-C 18W/827/XEW/4P/ ALTO 14W	CFQ18W/G24q/827	10	5 1/16	12,000	1010	82	1100	11	$1.69	2700
			22040-0	•	PL-C 18W/835/XEW/4P/ ALTO 14W	CFQ18W/G24q/835	10	5 1/16	12,000	1010	82	1100	11	$1.69	3500
			22041-8	•	PL-C 18W/841/XEW/4P/ ALTO 14W	CFQ18W/G24q/841	10	5 1/16	12,000	1010	82	1100	11	$1.69	4100
21	PL-C	G24q-3	22042-6	•	PL-C 26W/827/XEW/4P/ ALTO 21W	CFQ26W/G24q/827	10	6½	12,000	1400	82	1525	11	$2.53	2700
			22047-5	•	PL-C 26W/835/XEW/4P/ ALTO 21W	CFQ26W/G24q/835	10	6½	12,000	1400	82	1525	11	$2.53	3500
			22048-3	•	PL-C 26W/841/XEW/4P/ ALTO 21W	CFQ26W/G24q/841	10	6½	12,000	1400	82	1525	11	$2.53	4100
PL-C (Cluster) 4-Pin															
13	PL-C	G24q-1	38325-7	•	PL-C 13W/827/4P/ALTO	CFQ13W/G24q/827	10	5 3/16	12,000	775	82	900	11	$1.57	2700
			38326-5	•	PL-C 13W/830/4P/ALTO	CFQ13W/G24q/830	10	5 3/16	12,000	775	82	900	11	$1.57	3000
			38327-3	•	PL-C 13W/835/4P/ALTO	CFQ13W/G24q/835	10	5 3/16	12,000	775	82	900	11	$1.57	3500
			38328-1	•	PL-C 13W/841/4P/ALTO	CFQ13W/G24q/841	10	5 3/16	12,000	775	82	900	11	$1.57	4100
18	PL-C	G24q-2	38329-9	•	PL-C 18W/827/4P/ALTO	CFQ18W/G24q/827	10	5 1/16	12,000	1075	82	1250	11	$2.17	2700
			38330-7	•	PL-C 18W/830/4P/ALTO	CFQ18W/G24q/830	10	5 1/16	12,000	1075	82	1250	11	$2.17	3000
			38332-3	•	PL-C 18W/835/4P/ALTO	CFQ18W/G24q/835	10	5 1/16	12,000	1075	82	1250	11	$2.17	3500
			38333-1	•	PL-C 18W/841/4P/ALTO	CFQ18W/G24q/841	10	5 1/16	12,000	1075	82	1250	11	$2.17	4100
26	PL-C	G24q-3	38334-9	•	PL-C 26W/827/4P/ALTO	CFQ26W/G24q/827	10	6½	12,000	1550	82	1800	11	$3.13	2700
			38335-6	•	PL-C 26W/830/4P/ALTO	CFQ26W/G24q/830	10	6½	12,000	1550	82	1800	11	$3.13	3000
			38336-4	•	PL-C 26W/835/4P/ALTO	CFQ26W/G24q/835	10	6½	12,000	1550	82	1800	11	$3.13	3500
			38337-2	•	PL-C 26W/841/4P/ALTO	CFQ26W/G24q/841	10	6½	12,000	1550	82	1800	11	$3.13	4100

For the most current product information, go to the e-catalog on **www.philips.com**
Compact fluorescent symbols and footnotes located on page 59

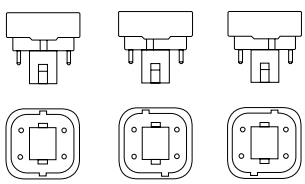
Philips PL-C
Warranty Period: 18 months*

Philips PL-C Energy Advantage
Warranty Period: 24 months*

* Certain limitations and conditions apply.
See Philips for further warranty details.



PL-C 4-Pin



PL-C 4-Pin G24q-1 Base | PL-C 4-Pin G24q-2 Base | PL-C 4-Pin G24q-3 Base

Compact Fluorescent Lamps

PL-T Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Description	Generic Designation	Pkg. Qty.	MOL (In.)	Rated Avg. Life (Hrs.) (230)	Design Lumens (208)	CRI	Brightness (Lumens) (231)	Life (Yrs.) (446)	Energy Cost (445)	Light Appear. (CCT)
PL-T (Triple) 4-Pin, Energy Advantage													**FTC REQUIREMENTS***		
21	PL-T	GX24q-3	40779-1	•	PL-T 26W/830/XEW/A/4P/ ALTO 21W	CFTR26W/GX24q/830	10	5	16,000	1235	82	1400	14.6	$2.53	3000
			40780-9	•	PL-T 26W/835/XEW/A/4P/ ALTO 21W	CFTR26W/GX24q/835	10	5	16,000	1235	82	1400	14.6	$2.53	3500
27	PL-T	GX24q-3	22021-0	•	PL-T 32W/830/XEW/A/4P/ ALTO 27W	CFTR32W/GX24q/830	10	5½	16,000	1725	82	1875	14.6	$3.25	3000
			22022-8	•	PL-T 32W/835/XEW/A/4P/ ALTO 27W	CFTR32W/GX24q/835	10	5½	16,000	1725	82	1875	14.6	$3.25	3500
			22024-4	•	PL-T 32W/841/XEW/A/4P/ ALTO 27W	CFTR32W/GX24q/841	10	5½	16,000	1725	82	1875	14.6	$3.25	4100
33	PL-T	GX24q-4	22026-9	•	PL-T 42W/830/XEW/A/4P/ ALTO 33W	CFTR42W/GX24q/830	10	6⅓	16,000	2400	82	2615	14.6	$3.97	3000
			22028-5	•	PL-T 42W/835/XEW/A/4P/ ALTO 33W	CFTR42W/GX24q/835	10	6⅓	16,000	2400	82	2615	14.6	$3.97	3500
			22029-3	•	PL-T 42W/841/XEW/A/4P/ ALTO 33W	CFTR42W/GX24q/841	10	6⅓	16,000	2400	82	2615	14.6	$3.97	4100
PL-T (Triple) 4-Pin															
18	PL-T	GX24q-2	38437-0	•	PL-T 18W/827/A/4P/ALTO	CFTR18W/GX24q/827	12	4⅝	16,000	1020	82	1200	14.6	$2.17	2700
			26802-9	•	PL-T 18W/830/A/4P/ALTO	CFTR18W/GX24q/830	12	4⅝	16,000	1020	82	1200	14.6	$2.17	3000
			26820-1	•	PL-T 18W/835/A/4P/ALTO	CFTR18W/GX24q/835	12	4⅝	16,000	1020	82	1200	14.6	$2.17	3500
			26822-7	•	PL-T 18W/841/A/4P/ALTO	CFTR18W/GX24q/841	12	4⅝	16,000	1020	82	1200	14.6	$2.17	4100
26	PL-T	GX24q-3	38440-4	•	PL-T 26W/827/A/4P/ALTO	CFTR26W/GX24q/827	12	5	16,000	1530	82	1800	14.6	$3.13	2700
			26823-5	•	PL-T 26W/830/A/4P/ALTO	CFTR26W/GX24q/830	12	5	16,000	1530	82	1800	14.6	$3.13	3000
			26824-3	•	PL-T 26W/835/A/4P/ALTO	CFTR26W/GX24q/835	12	5	16,000	1530	82	1800	14.6	$3.13	3500
			26825-0	•	PL-T 26W/841/A/4P/ALTO	CFTR26W/GX24q/841	12	5	16,000	1530	82	1800	14.6	$3.13	4100
32	PL-T	GX24q-3	38443-8	•	PL-T 32W/827/A/4P/ALTO	CFTR32W/GX24q/827	12	5⅝	16,000	2040	82	2400	14.6	$3.85	2700
			26832-6	•	PL-T 32W/830/A/4P/ALTO	CFTR32W/GX24q/830	12	5⅝	16,000	2040	82	2400	14.6	$3.85	3000
			26833-4	•	PL-T 32W/835/A/4P/ALTO	CFTR32W/GX24q/835	12	5⅝	16,000	2040	82	2400	14.6	$3.85	3500
			26872-2	•	PL-T 32W/841/A/4P/ALTO	CFTR32W/GX24q/841	12	5⅝	16,000	2040	82	2400	14.6	$3.85	4100
42	PL-T	GX24q-4	14900-5	•	PL-T 42W/827/A/4P/ALTO	CFTR42W/GX24q/827	10	6⅜	16,000	2720	82	3200	14.6	$5.06	2700
			14901-3	•	PL-T 42W/830/A/4P/ALTO	CFTR42W/GX24q/830	10	6⅜	16,000	2720	82	3200	14.6	$5.06	3000
			14902-1	•	PL-T 42W/835/A/4P/ALTO	CFTR42W/GX24q/835	10	6⅜	16,000	2720	82	3200	14.6	$5.06	3500
			14903-9	•	PL-T 42W/841/A/4P/ALTO	CFTR42W/GX24q/841	10	6⅜	16,000	2720	82	3200	14.6	$5.06	4100
57	PL-T	GX24q-5	14631-6		PL-T 57W/830/A/4P	CFTR57W/GX24q/830	10	7¹¹⁄₁₆	16,000	3741	82	4300	14.6	$6.87	3000
			14632-4		PL-T 57W/835/A/4P	CFTR57W/GX24q/835	10	7¹¹⁄₁₆	16,000	3741	82	4300	14.6	$6.87	3500
			14633-2		PL-T 57W/841/A/4P	CFTR57W/GX24q/841	10	7¹¹⁄₁₆	16,000	3741	82	4300	14.6	$6.87	4100

For the most current product information, go to the e-catalog on **www.philips.com**

Compact fluorescent symbols and footnotes located on page 59

Philips PL-T
Warranty Period: 18 months*

Philips PL-T
Energy Advantage
Warranty Period: 24 months*

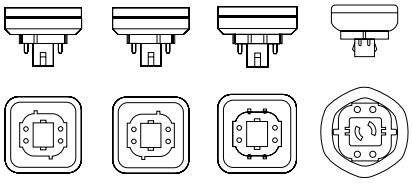
* Certain limitations and conditions apply. See Philips for further warranty details.



PL-T 4-Pin Energy Advantage

PL-T 4-Pin Instant-On

PL-T 4-Pin



PL-T 4-Pin GX24q-2 Base

PL-T 4-Pin GX24q-3 Base

PL-T 4-Pin GX24q-4 Base

PL-T 4-Pin GX24q-5 Base

Compact Fluorescent Lamps

PL-L Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Description	Generic Designation	Pkg. Qty.	MOL (In.)	Rated Avg. Life (Hrs.) (230)	Design Lumens (208)	CRI	Brightness (Lumens) (231)	Life (Yrs.) (446)	Energy Cost (445)	Light Appear. (CCT)
PL-L (Long)—Energy Advantage														FTC REQUIREMENTS*	
25	PL-L	2G11	20913-0		PL-L 40W/830/XEW/ 4P/IS 25W	FT40W/2G11/RS/830	25	22½	24,000	2470	82	2600	21.9	$3.01	3000
			20914-8		PL-L 40W/835/XEW/ 4P/IS 25W	FT40W/2G11/RS/835	25	22½	24,000	2470	82	2600	21.9	$3.01	3500
			40652-0		PL-L 40W/835/XEW/ 4P/IS 25W	FT40W/2G11/RS/835	10	22½	24,000	2470	82	2600	21.9	$3.01	3500
			20915-5		PL-L 40W/841/XEW/ 4P/IS 25W	FT40W/2G11/RS/841	25	22½	24,000	2470	82	2600	21.9	$3.01	4100
PL-L (Long)															
18	PL-L	2G11	34500-9		PL-L 18W/830/4P	FT18W/2G11/830	25	8 5/16	15,000	1125	82	1250	13.7	$2.17	3000
			35932-3		PL-L 18W/835/4P	FT18W/2G11/835	25	8 5/16	15,000	1125	82	1250	13.7	$2.17	3500
			34501-7		PL-L 18W/841/4P	FT18W/2G11/841	25	8 5/16	15,000	1125	82	1250	13.7	$2.17	4100
24	PL-L	2G11	34505-8		PL-L 24W/830/4P	FT24W/2G11/830	25	12 1/16	15,000	1620	82	1800	13.7	$2.89	3000
			35933-1		PL-L 24W/835/4P	FT24W/2G11/835	25	12 1/16	15,000	1620	82	1800	13.7	$2.89	3500
			34508-2		PL-L 24W/841/4P	FT24W/2G11/841	25	12 1/16	15,000	1620	82	1800	13.7	$2.89	4100
36	PL-L	2G11	34511-6		PL-L 36W/830/4P	FT36W/2G11/830	25	16 7/16	15,000	2610	82	2900	13.7	$4.34	3000
			34942-3		PL-L 36W/835/4P	FT36W/2G11/835	25	16 7/16	15,000	2610	82	2900	13.7	$4.34	3500
			34513-2		PL-L 36W/841/4P	FT36W/2G11/841	25	16 7/16	15,000	2610	82	2900	13.7	$4.34	4100
40	PL-L	2G11	30042-6		PL-L 40W/830/4P/RS/IS	FT40W/2G11/RS/830	25	22½	20,000	2970	82	3300	18.3	$4.82	3000
			30043-4		PL-L 40W/835/4P/RS/IS	FT40W/2G11/RS/835	25	22½	20,000	2970	82	3300	18.3	$4.82	3500
			30044-2		PL-L 40W/841/4P/RS/IS	FT40W/2G11/RS/841	25	22½	20,000	2970	82	3300	18.3	$4.82	4100
50	PL-L	2G11	34747-6		PL-L 50W/830/4P/RS	FT50W/2G11/RS/830	25	22½	20,000	3870	82	4300	18.3	$6.02	3000
			34753-4		PL-L 50W/835/4P/RS	FT50W/2G11/RS/835	25	22½	20,000	3870	82	4300	18.3	$6.02	3500
			34770-8		PL-L 50W/841/4P/RS	FT50W/2G11/RS/841	25	22½	20,000	3870	82	4300	18.3	$6.02	4100
55	PL-L	2G11	13844-6		PL-L 55W/950/4P/RS	FT55W/2G11/RS/950	25	21⅜	20,000	3358	91	3650	18.3	$6.62	5000
80	PL-L	2G11	38698-7		PL-L 80W/835/4P	FT80W/2G11/835	25	22½	20,000	5400	82	6000	18.3	$9.64	3500
			38699-5		PL-L 80W/841/4P	FT80W/2G11/841	25	22½	20,000	5400	82	6000	18.3	$9.64	4100
PL-Q Square Shape—4 Pin															
38	PL-Q	GR10q	15941-8		PL-Q 38W/827/4P	CFS38W/GR10q/827	10	8½	10,000	2395	82	2850	9.1	$4.58	2700

For the most current product information, go to the e-catalog on **www.philips.com**

Compact fluorescent symbols and footnotes located on page 59

Philips PL-L Standard
Warranty Period: 24 months*

Philips PL-L Energy Advantage
Warranty Period: 30 months*

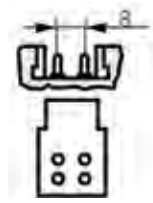
Philips PL-Q
Warranty Period: 12 months*

* Certain limitations and conditions apply. See Philips for further warranty details.


PL-L 2G11


PL-L 2G11 Base


PL-Q


PL-Q GR10q Base

Compact Fluorescent Lamps

Consumer Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Description	Generic Designation	Pkg. Qty.	MOL (In.)	Rated Avg. Life (Hrs.) (230)	Design Lumens (208)	CRI	Brightness (Lumens) (231)	Life (Yrs.) (446)	Energy Cost (445)	Light Appear. (CCT)
Consumer Lamps												**FTC REQUIREMENTS¥**			
5	PL-S	G23	23021-9	●	PL-S 5W/827/2P/ALTO	14671-2	6	4 9/32	10,000	215	80	250	9.1	$0.60	2700
7	PL-S	G23	23022-7	●	PL-S 7W/827/2P/ALTO	14871-8	6	5 11/32	10,000	340	80	400	9.1	$0.84	2700
9	PL-S	G23	23032-6	●	PL-S 9W/827/2P/ALTO	14867-6	6	6 19/32	10,000	510	80	600	9.1	$1.08	2700
13	PL-S	GX23	23010-2	●	PL-S 13W/827/2P/ALTO	14681-1	6	7 1/64	10,000	675	80	800	9.1	$1.57	2700
			23012-8	●	PL-S 13W/841/2P/ALTO	14685-2	6	7 1/64	10,000	675	80	800	9.1	$1.57	4100
	PL-C	GX23-2	23039-1		PL-C 13W/827/2P USA	38310-9	6	4 5/8	10,000	730	80	860	9.1	$1.57	2700
			23040-9		PL-C 13W/841/2P USA	38313-3	6	4 5/8	10,000	730	80	860	9.1	$1.57	4100
	PL-C	G24q-1	23035-9		PL-C 13W/827/4P	38325-7	6	5 3/16	10,000	665	80	780	9.1	$1.57	2700
			23036-7		PL-C 13W/841/4P	38328-1	6	5 3/16	10,000	665	80	780	9.1	$1.57	4100
18	PL-C	G24q-2	23041-7		PL-C 18W/827/4P	38329-9	6	6	10,000	990	80	1150	9.1	$2.17	2700
	PL-T	GX24q-2	40981-3	●	PL-T 18W/827/4P/ALTO	38437-0	6	4 5/8	12,000	1020	80	1200	9.1	$2.17	2700
26	PL-C	G24q-3	23042-5		PL-C 26W/827/4P	38334-9	6	6 13/16	10,000	1470	80	1710	9.1	$3.13	2700
			23044-1		PL-C 26W/835/4P	38336-4	6	6 13/16	10,000	1470	80	1710	9.1	$3.13	3500
	PL-T	GX24q-3	23045-8	●	PL-T 26W/827/4P/ALTO	38440-4	6	5	12,000	1530	80	1800	11.0	$3.13	2700
			41860-8	● †	PL-T 26W/841/4P/ALTO	26825-0	6	5	12,000	1530	80	1800	11.0	$3.13	4100

For the most current product information, go to the e-catalog on **www.philips.com**

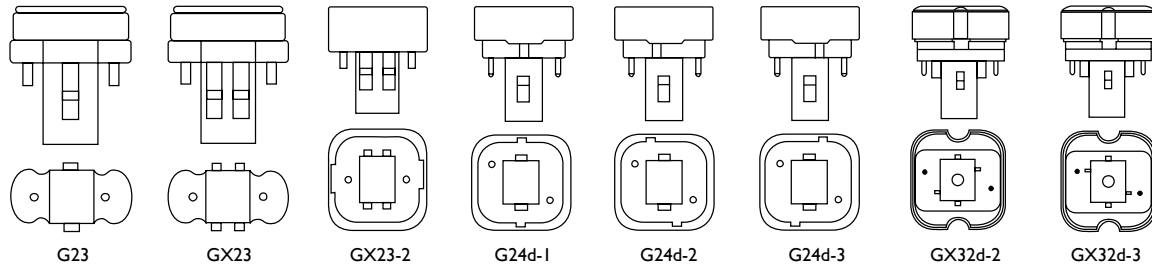
Compact fluorescent symbols and footnotes located on page 59



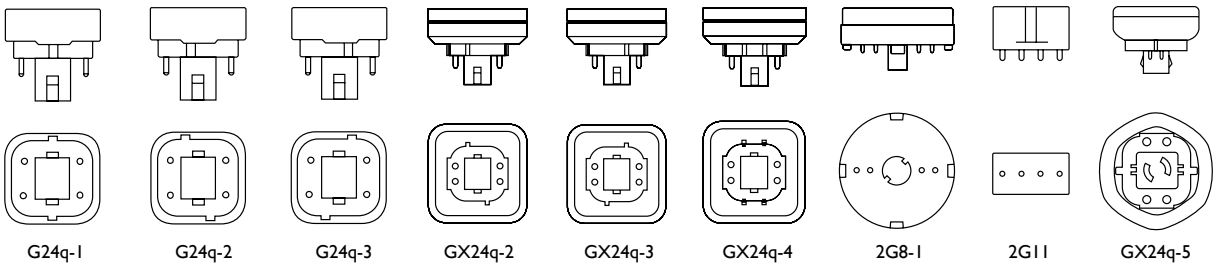
Compact Fluorescent Lamps

PL Base Types and Bulb Shapes

PL Base Types (Not Actual Sizes)

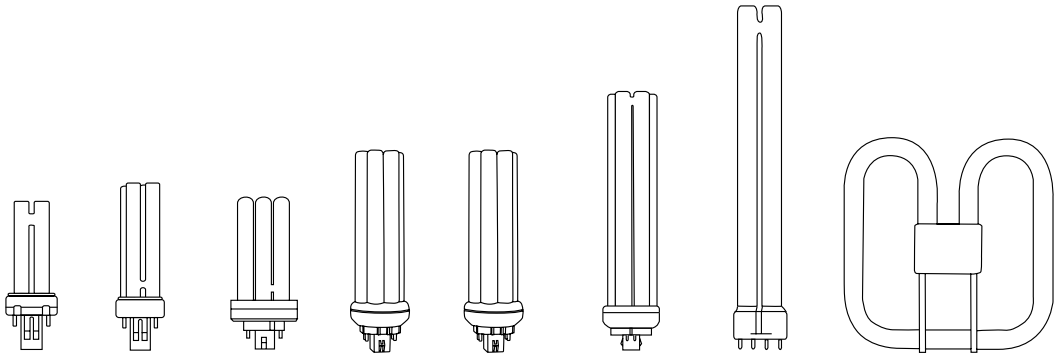


G23 GX23 GX23-2 G24d-1 G24d-2 G24d-3 GX32d-2 GX32d-3



G24q-1 G24q-2 G24q-3 GX24q-2 GX24q-3 GX24q-4 2G8-1 2G11 GX24q-5

PL Bulb Shapes (Not Actual Sizes)



PL-S PL-C PL-T PL-T Energy Advantage PL-T Instant-On 57W PL-T PL-L PL-Q

For the most current product information, go to the e-catalog on www.philips.com

▢ Exclusive to Philips Lighting Company

● This lamp is better for the environment because of its reduced mercury content. All Philips ALTO lamps give you end-of-life options, which can simplify and reduce your lamp disposal costs, depending on your state and local regulations

■ ENERGY STAR Bulb: As an ENERGY STAR Partner, Philips has determined that this product meets the ENERGY STAR guidelines for energy efficiency

X Orders will be shipped until inventory is depleted; no longer manufactured

ⓔThis Bulb Meets US Federal Minimum Efficiency Standard

† New since last printing

◇ Designed for instant start operation

T– ENERGY STAR testing in progress

§ "Made-To-Order". Product is not kept in inventory. Minimum quantities will apply

¥ For more information about FTC requirements please see rule 16 CFR part 305 @ www.ftc/os/2000/02/16cfr305

(208) Design lumens are the approximate lamp lumen output at 40% of the lamp's rated average life. This output is based upon measurements obtained during lamp operation on a reference ballast under standard laboratory conditions.

(230) Average life under specified test conditions with lamps turned off and restarted no more frequently than once every 3 operating hours. Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not.

(231) Approximate initial lumens. The lamp lumen output is based upon lamp performance after 100 hours of operating life under standard laboratory conditions.

(445) Estimated energy cost is based on 3 hrs/day, 11¢/kWh. Cost depends on rates and use.

(446) Life in years is based on 3 hrs/day.

Compact Fluorescent Lamps

Cross Reference Guide

Philips	Generic Designation	GE	OSI
PL-S			
PL-S 5W/827	CFT5W/G23/827	F5BX/SPX27	CF5DS/827
PL-S 7W/827	CFT7W/G23/827	F7BX/SPX27	CF7DS/827
PL-S 7W/835	CFT7W/G23/835	F7BX/SPX35	CF7DS/835
PL-S 7W/841	CFT7W/G23/841	F7BX/SPX41	CF7DS/841
PL-S 7W/850	CFT7W/G23/850	F7BX/SPX50	CF7DS/850
PL-S 9W/827	CFT9W/G23/827	F9BX/SPX27	CF9DS/827
PL-S 9W/835	CFT9W/G23/835	F9BX/SPX35	CF9DS/835
PL-S 9W/841	CFT9W/G23/841	F9BX/SPX41	CF9DS/841
PL-S 9W/850	CFT9W/G23/850	F9BX/SPX50	CF9DS/850
PL-S 13W/827	CFT13W/GX23/827	F13BX/SPX27	CF13DS/827
PL-S 13W/830	CFT13W/GX23/830	F13BX/SPX30	CF13DS/830
PL-S 13W/835	CFT13W/GX23/835	F13BX/SPX35	CF13DS/835
PL-S 13W/841	CFT13W/GX23/841	F13BX/SPX41	CF13DS/841
PL-S 13W/850	CFT13W/GX23/850	F13BX/SPX50	CF13DS/850
PL-C 2-PIN			
PL-C 13W/827/USA/ALTO	CFQ13W/GX23/827	F13DBX23T4/SPX27	CF13DD/827
PL-C 13W/830/USA/ALTO	CFQ13W/GX23/830	F13DBX23T4/SPX30	CF13DD/830
PL-C 13W/835/USA/ALTO	CFQ13W/GX23/835	F13DBX23T4/SPX35	CF13DD/835
PL-C 13W/841/USA/ALTO	CFQ13W/GX23/841	F13DBX23T4/SPX41	CF13DD/841
PL-C 13W/827/ALTO	CFQ13W/G24d/827	F13DBXT4/SPX27	—
PL-C 13W/830/ALTO	CFQ13W/G24d/830	F13DBXT4/SPX30	—
PL-C 18W/827/ALTO	CFQ18W/G24d/827	F18DBXT4/SPX27	CF18DD/827
PL-C 18W/830/ALTO	CFQ18W/G24d/830	F18DBXT4/SPX30	CF18DD/830
PL-C 18W/835/ALTO	CFQ18W/G24d/835	F18DBXT4/SPX35	CF18DD/835
PL-C 18W/841/ALTO	CFQ18W/G24d/841	F18DBXT4/SPX41	CF18DD/841
PL-C 26W/827/ALTO	CFQ26W/G24d/827	F26DBXT4/SPX27	CF26DD/827
PL-C 26W/830/ALTO	CFQ26W/G24d/830	F26DBXT4/SPX30	CF26DD/830
PL-C 26W/835/ALTO	CFQ26W/G24d/835	F26DBXT4/SPX35	CF26DD/835
PL-C 26W/841/ALTO	CFQ26W/G24d/841	F26DBXT4/SPX41	CF26DD/841
PL-C 2-PIN 15MM			
PL-C 15MM/22W/827	CFQ20W/GX32d/827	—	—
PL-C 15MM/28W/827	CFQ27W/GX32d/827	—	—
PL-C 4-PIN			
PL-C 13W/827/4P/ALTO	CFQ13W/G24q/827	F13DBX/SPX27/4P	CF13DD/E/827
PL-C 13W/830/4P/ALTO	CFQ13W/G24q/830	F13DBX/SPX30/4P	CF13DD/E/830
PL-C 13W/835/4P/ALTO	CFQ13W/G24q/835	F13DBX/SPX35/4P	CF13DD/E/835
PL-C 13W/841/4P/ALTO	CFQ13W/G24q/841	F13DBX/SPX41/4P	CF13DD/E/841
PL-C 18W/827/4P/ALTO	CFQ18W/G24q/827	F18DBX/SPX27/4P	CF18DD/E/827
PL-C 18W/830/4P/ALTO	CFQ18W/G24q/830	F18DBX/SPX30/4P	CF18DD/E/830
PL-C 18W/835/4P/ALTO	CFQ18W/G24q/835	F18DBX/SPX35/4P	CF18DD/E/835
PL-C 18W/841/4P/ALTO	CFQ18W/G24q/841	F18DBX/SPX41/4P	CF18DD/E/841
PL-C 26W/827/4P/ALTO	CFQ26W/G24q/827	F26DBX/SPX27/4P	CF26DD/E/827
PL-C 26W/830/4P/ALTO	CFQ26W/G24q/830	F26DBX/SPX30/4P	CF26DD/E/830
PL-C 26W/835/4P/ALTO	CFQ26W/G24q/835	F26DBX/SPX35/4P	CF26DD/E/835
PL-C 26W/841/4P/ALTO	CFQ26W/G24q/841	F26DBX/SPX41/4P	CF26DD/E/841

Compact Fluorescent Lamps

Cross Reference Guide

Philips	Generic Designation	GE	OSI
PL-L			
PL-L 18W/830	FT18W/2G11/830	F18BX/SPX30	FT18DL/830
PL-L 18W/835	FT18W/2G11/835	F18BX/SPX35	FT18DL/835
PL-L 18W/841	FT18W/2G11/841	F18BX/SPX41	FT18DL/841
PL-L 18W/830	FT18W/2G11/RS/830	F18BX/SPX30/RS	FT18DL/830/RS
PL-L 18W/835	FT18W/2G11/RS/835	F18BX/SPX35/RS	FT18DL/835/RS
PL-L 18W/841	FT18W/2G11/RS/841	F18BX/SPX41/RS	FT18DL/841/RS
PL-L 24W/830	FT24W/2G11/830	F27/24BX/SPX30	FT24DL/830
PL-L 24W/835	FT24W/2G11/835	F27/24BX/SPX35	FT24DL/835
PL-L 24W/841	FT24W/2G11/841	F27/24BX/SPX41	FT24DL/841
PL-L 36W/830	FT36W/2G11/830	F39/36BX/SPX30	FT36DL/830
PL-L 36W/835	FT36W/2G11/835	F39/36BX/SPX35	FT36DL/835
PL-L 36W/841	FT36W/2G11/841	F39/36BX/SPX41	FT36DL/841
PL-L 40W/830/RS/IS	FT40W/2G11/RS/830	F40/30BX/SPX30	FT40DL/830/RS
PL-L 40W/835/RS/IS	FT40W/2G11/RS/835	F40/30BX/SPX35	FT40DL/835/RS
PL-L 40W/841/RS/IS	FT40W/2G11/RS/841	F40/30BX/SPX41	FT40DL/841/RS
PL-L 50W/830/RS	FT50W/2G11/RS/830	F50BX/SPX30/RS	—
PL-L 50W/835/RS	FT50W/2G11/RS/835	F50BX/SPX35/RS	—
PL-L 50W/841/RS	FT50W/2G11/RS/841	F50BX/SPX41/RS	—
PL-L 80W/830	FT80W/2G11/830	—	FT80DL/830
PL-L 80W/835	FT80W/2G11/835	—	FT80DL/835
PL-L 80W/841	FT80W/2G11/841	—	FT80DL/841
PL-T 4-PIN			
PL-T 18W/827/4P/ALTO	CFTR18W/GX24q/827	F18TBX/SPX27/A/4P	CF18DT/E/IN/827
PL-T 18W/830/4P/ALTO	CFTR18W/GX24q/830	F18TBX/SPX30/A/4P	CF18DT/E/IN/830
PL-T 18W/835/4P/ALTO	CFTR18W/GX24q/835	F18TBX/SPX35/A/4P	CF18DT/E/IN/835
EL			
EL/mdT 5W	—	—	—
EL/mdT 9W T2	—	FLE10HT3/2/827	—
EL/mdT 11W	—	—	—
EL/mdT2 13W	—	FLE13HT2/2/827	CF13EL/MINI/827
EL/mdT2 13W 3.5K			CF13EL/MINI/830
EL/mdT2 13W 4.1K	—	—	CF13EL/MINI/841
EL/mdT2 13W 5K	—	—	CF13EL/MINI/850/BL
EL/mdT2 18W	—	FLE20HT3/2/827	CF19EL/MINI/827
EL/mdT2 23W	—	FLE23HT3/2/XL827	CF23EL/MINI/827
EL/mdT 27W	—	—	—
EL/mdT 27W 4K	—	—	—
EL/mdT 27W 5K	—	—	—
EL/mdT2 26W	—	FLE26HT3/2/XL827	—
EL/mdT2 26W 4.1K	—	FLE26HT3/2/841	—
EL/mdT2 26W 5k	—	FLE26HT3/2/6STP	—
EL/mdT 32W	—	FLE29HLX/2XL/827	CF30EL/TWIST/827
EL/mdT 32W 3K	—	—	CF30EL/MINI/835/DAY/B
EL/mdT D2D 14W	—	—	—
EL/dT 42W	—	FLE42HLX/2/XL827	CF40EL/TWIST/827
El/mdT 13W GU24	—	FLE15HT3/2GU24CD	CF13EL/GU24/827/BL
EL/mdT 13W GU24 4.1K		—	—
EL/mdT 18W GU24	—	FLE20HT3/2GU24CD	—
EL/mdT 18W GU24 4.1K	—	—	—
EL/mdT 23W GU24	—	FLE26HT3/2GU24CD	CF23EL/GU24/827/BL
EL/mdT 23W GU24 4.1K	—	—	—

Compact Fluorescent Lamps

Cross Reference Guide

Philips	Generic Designation	GE	OSI
EL			
EL/mCan T2 5W	—	FLE5/2/CAC/827	CF4EL/B15/C/827
EL/Can T2 5W	—	FLE5/2/CAM/827	CF7EL/B15/827
EL/mCan T2 9W	—	FLE9/2/CAC/827	CF9EL/B14/C/830/ADP/BL2
EL/Can T2 9W	—	FLE9/2/CAM/827	—
EL/A FAN 5W	—	—	—
EL/A FAN 9W	—	FLE11/2/A17XL/CD	
EL/A G18 9W	—	—	—
EL/A G25 T3 9W	—	FLE11/2/G25XL	CF9EL/G25/827
EL/A G30 16W	—	—	—
EL/A G40 23W	—	—	—
EL/A SWP 9W	—	FLE11/2/A17XL/CD	CF9EL/A19/827
EL/A SWP 14W	—	FLE15/2/A19XL	CF14EL/A19/827
EL/A SWP 14W BAW	—	FLE11/2TC14BUGCD	CF14EL/A19/Y/BL
EL/A SWP 20W	—	FLE20/2/A19XL	—
EL/O 14W	—	FLE14/2/TC16SWCD	CF14EL/T20/830
EL/A PAR38 23W 2pc	—	FLE26/2/PAR38/XL	CF23EL/PAR38/GL/827
EL/A R20 14W	—	FLE11/2/R20XL827	CF14EL/R20/827
EL/A 15W R30	—	FLE15/2/R30XL827	CF16EL/BR30/827
EL/A R40 23W	—	FLE26/2/R40XL827	CF20EL/BR40/827
EL/A PAR38 23W	—	FLE26/2PAR38XCD	CF23EL/PAR38/827
EL/A R30 EDIM 16W	—	FLE15/2DVR30SWCD	CF15EL/BR30/DIM/827
EL/A R40 EDIM 20W	—	FLE26/2/DV/R40	—
EL/A PAR38 EDIM 20W	—	—	—
Silicone			
EL/A T2 SC 14W	—	—	—
EL/A T2 SC 9W	—	—	—
EL/A T2 SC 5W	—	—	—
EL/mA T2 SC 9W	—	—	—
EL/O SC 18W	—	—	—
EL/mCan T2 SC 5W	—	—	—
EL/Can T2 SC 5W	—	—	—
EL/mCan T2 SC 9W	—	—	—
EL/Can T2 SC 9W	—	—	—
EL/mG16.5 T2 SC 8W	—	—	—
EL/G16.5 T2 SC 8W	—	—	—
Universal			
Universal 14W ALTO	—	—	—
Universal 20W ALTO	—	—	—
Universal 25W ALTO	—	—	—
Helix Twister			
Helix Twister EL/3W 11-23-34	—	FLE32HT3/2D3/BX	CF28EL/3WAY/TWIST/827
Two Piece Circline			
32W Two Piece Circline	—	FEA30CIR/SW/CD	—
40W Two Piece Circline	—	—	—
Genie Pro Pack 6PK			
14W Genie Pro Pack 6PK	—	FLE14TBX/2/SW/CD	—
18W Genie Pro Pack 6PK	—	—	—

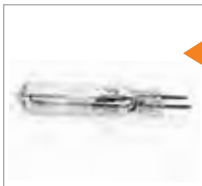
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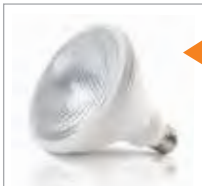

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High Pres-sure Sodium Lamps
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Low Pressure Sodium Lamps
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Mercury Vapor Lamps
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Upgrade to a better white light—Philips High Intensity Discharge lighting solutions.

A new age in outdoor lighting

Lighting plays an important role in transforming the look of an outdoor space. Whether you are looking to create a unique identity for your city, add a sense of safety and security to an outdoor space, or light a local sports stadium, Philips has a solution for you.

Philips MasterColor CDM Elite MW Lamps combine high efficacy with excellent quality white light and long, stable lifetime performance. This lamp is designed with a new socket allowing for more flexible use and enhanced optical efficiency.

Philips Energy Advantage CDM with AllStart Technology is a high-efficiency CDM lighting retrofit solution for existing quartz metal halide systems that provides energy savings without compromising light quality.

MasterColor Elite Ceramic Metal Halide Tubular T6 100W Lamp gives a unique combination of unbeatable light quality and consistent performance over lifetime. This is a compact, energy efficient lamp that provides crisp, sparkling white light.

Current Product	Philips Upgrade Product	Benefit	Page
400W Metal Halide (Quartz Probe Start) (450W System)	MasterColor CDM Elite MW 210W (225W System)	• Approximately 50% in total system energy savings* • 20% longer rated average life (24K hours versus 20K hours) • Better CRI and color consistency than standard quartz metal halide	67
175W/250W/400W Metal Halide (Quartz Probe or Pulse Start) Lamp	145W/205W/330W Energy Advantage CDM with AllStart Technology Lamp	• Up to 18% energy savings with a simple lamp change** • Longer rated average life◊ • Excellent CRI and color consistency	72
150W MasterColor Ceramic Metal Halide Tubular T6 Lamp	MasterColor Elite Ceramic Metal Halide Tubular T6 Lamp 100W	• Approximately 33% in total system energy savings† • 25% longer rated average life (15K hours versus 12K hours) • Excellent lumen maintenance with 90 CRI	66

* 450W - 225W = 225W / 450W = 50%

** 145W CDM lamp with AllStart Technology compared to 175W QMH, 205W CDM with AllStart Technology compared to 250W QMH, 330W CDM with AllStart Technology compared to 400W QMH

◊ 10,000 hours longer in vertical position and 12,500 hours longer in horizontal position for 145W and 205W lamps compared to 175W and 250W standard Probe Start QMH lamps, 4000 hours more for the 330W compared to 400W standard Probe Start QMH lamps.

† 100W vs. 150W

High Intensity Discharge Lamps

MasterColor Ceramic Metal Halide Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
Mini MasterColor ELITE Ceramic Metal Halide Tubular Single-Ended GU6.5 Lamps (391, 392, 396, 397)															
Enclosed luminaires only; lifetime color stability within ±200K															
20	T4	GU6.5	40850-0	★	CDM20/TM/830/ GU6.5 ELITE	C156/E	12	G, Clear, FadeBlock	1⅛	2¼	15,000	1800	1550	85	3000
39	T4	GU6.5	41879-8	★	CDM35/TM/930/ GU6.5 ELITE	C130/E	12	G, Clear, FadeBlock	1⅛	2¼	15,000	3900	3300	90	3000
50	T4	GU6.5	41880-6	★	CDM50/TM/930/ GU6.5 ELITE	C193/E	12	G, Clear, FadeBlock	1⅛	2¼	15,000	5200	4400	91	3000
Mini MasterColor Ceramic Metal Halide Tubular Single-Ended T3.5 Lamps (391, 392, 396, 397)															
Enclosed luminaires only; lifetime color stability within ±200K															
22	T3.5	PGJ5	14040-0	★	CDM20/TM/830	C175/E	12	G, Clear, FadeBlock	⅜	1¾	12,000	1650	1155	85	3000
39	T3.5	PGJ5	21139-1	★	CDM35/TM/930	C179/E	12	G, Clear, FadeBlock	⅜	1¾	12,000	3000	2400	90	3000
MasterColor Evolution Ceramic Metal Halide Tubular Single-Ended T4 Lamps (391, 392, 396, 397)															
For use on Thermally Protected Electronic Ballasts Only															
20	T4	G8.5	42879-7	★▢†✱	CDM Evolution20/TC/930	C156/E	12	G, Clear, FadeBlock	2	3 1/32	20,000	2050	1640	90	3000
39	T4	G8.5	42790-6	★▢†✱	CDM Evolution35/TC/930	C130/E	12	G, Clear, FadeBlock	2	3 1/32	20,000	4400	3520	90	3000
MasterColor Elite Ceramic Metal Halide Tubular Single-Ended T4 Lamps (391, 392, 396, 397)*															
20	T4	G8.5	41046-4	★	CDM Elite 20/TC/830	C156/E	12	G, Clear, FadeBlock	2	3 1/32	15,000	1800	1550	85	3000
39	T4	G8.5	40916-9	★	CDM Elite 35/TC/930	C130/E	12	G, Clear, FadeBlock	2	3 1/32	15,000	4000	3500	90	3000
			42079-4	★	CDM Elite35/TC/942	C130/E	12	G, Clear, FadeBlock	2	3 1/32	15,000	3700	3200	88	4200
50	T4	G8.5	41415-1	★▢	CDM Elite 50/TC/930	C193/E	12	G, Clear, FadeBlock	2	3 1/32	15,000	5400	4750	90	3000
70	T4	G8.5	40917-7	★	CDM Elite 70/TC/930	C139/E	12	G, Clear, FadeBlock	2	3 1/32	15,000	7650	6700	90	3000
			41898-7	★	CDM Elite70/TC/942	C139/E	12	G, Clear, FadeBlock	2	3 1/32	15,000	7400	6500	90	4200
MasterColor Ceramic Metal Halide Tubular Single-Ended T4 Lamps (391, 392, 396, 397)															
Enclosed luminaires only; lifetime color stability within ±200K															
39	T4	G8.5	37372-0	★	CDM35/TC/830	C130/E	12	G, Clear, FadeBlock	2	3 1/32	12,000	3300	2300	81	3000
			20883-5	★	CDM35/TC/842	C130/E	12	G, Clear, FadeBlock	2	3 1/32	12,000	3300	2640	85	4200
70	T4	G8.5	37373-8	★	CDM70/TC/830	C139/E	12	G, Clear, FadeBlock	2	3 1/32	12,000	6400	4500	83	3000
			20885-0	★	CDM/70/TC/942	C139/E	12	G, Clear, FadeBlock	2	3 1/32	12,000	5900	3840	90	4200
MasterColor Evolution Ceramic Metal Halide Tubular Single-Ended T6 Lamps (391, 392, 396, 397)															
For use on Thermally Protected Electronic Ballasts Only															
20	T6	G12	42878-9	★▢†✱	CDM Evolution20/T6/930	C156/E	12	G, Clear, FadeBlock	2 7/32	3 15/16	20,000	2050	1640	90	3000
39	T6	G12	42791-4	★▢†✱	CDM Evolution35/T6/930	C130/E	12	G, Clear, FadeBlock	2 7/32	3 15/16	20,000	4400	3520	90	3000
MasterColor Elite Ceramic Metal Halide Tubular Single-Ended T6 Lamps (391, 392, 396, 397)															
Enclosed luminaires only; lifetime color stability within ±200K															
20	T6	G12	41047-2	★	CDM Elite 20/T6/830	C156/E	12	G, Clear, FadeBlock	2 7/32	3 5/16	15,000	1800	1550	85	3000
39	T6	G12	40914-4	★	CDM Elite 35/T6/930	C130/E	12	G, Clear, FadeBlock	2 7/32	3 5/16	15,000	4000	3500	90	3000
			42081-0	★	CDM Elite35/T6/942	C130/E	12	G, Clear, FadeBlock	2 7/32	3 5/16	15,000	3800	3380	88	4200
50	T6	G12	41416-9	★▢	CDM Elite 50/T6/930	C193/E	12	G, Clear, FadeBlock	2 7/32	3 5/16	15,000	5400	4750	90	3000
			42144-6	★▢	CDM Elite50/T6/942	C193/E	12	G, Clear, FadeBlock	2 7/32	3 5/16	15,000	4900	4300	90	4200
70	T6	G12	40915-1	★	CDM Elite 70/T6/930	C139/E	12	G, Clear, FadeBlock	2 7/32	3 5/16	15,000	7650	6700	90	3000
			41899-5	★	CDM Elite70/T6/942	C139/E	12	G, Clear, FadeBlock	2 7/32	3 5/16	15,000	7500	6600	90	4200
100	T6	G12	40829-4	★	CDM Elite 100/T6/930	C191/E	12	G, Clear, FadeBlock	2 7/32	4 1/32	15,000	11,000	9680	90	3000

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Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref. or MBCP▯	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
MasterColor Ceramic Metal Halide Tubular Single-Ended T6 Lamps (391, 392, 396, 397)															
Enclosed luminaires only; lifetime color stability within ±200K															
39	T6	G12	22328-9	★	CDM35/T6/830	C130/E	12	G, Clear, FadeBlock	2½	3⅛	12,000	3300	2600	81	3000
			20886-8	★	CDM35/T6/842	C130/E	12	G, Clear, FadeBlock	2½	3⅛	12,000	3300	2800	84	4200
70	T6	G12	22337-0	★	CDM70/T6/830	C139/E	12	G, Clear, FadeBlock	2½	3⅛	12,000	6600	4950	81	3000
			28137-8	★	CDM70/T6/942	C139/E	12	G, Clear, FadeBlock	2½	3⅛	12,000	6600	4620	92	4200
150	T6	G12	23272-8	★	CDM150/T6/830	C142/E	12	G, Clear, FadeBlock, also ANSI M102	2½	4½	12,000	14,000	9800	85	3000
			37369-6	★	CDM150/T6/942	C142/E	12	G, Clear, FadeBlock, also ANSI M102	2½	4½	12,000	12,700	8900	96	4200
MasterColor CDM Elite MW (Medium Watt) Ceramic Metal Halide Tubular Single-Ended T9 Lamps (391, 392, 396, 397)															
Enclosed luminaires only															
210	T9	PGZ18	22062-4	▢★	CDM EliteMW 210/T9/930/U/E	C183/E	12	G, Clear, Fadeblock	3½	7½	27,000	24,200	21,735	90	3000
			22063-2	▢★	CDM EliteMW 210/T9/942/U/E	C183/E	12	G, Clear, Fadeblock	3½	7½	30,000	23,100	20,470	90	4200
315	T9	PGZ18	21831-3	▢★	CDM EliteMW 315/T9/930/U/E	C182/E	12	G, Clear, Fadeblock	3½	7½	30,000	37,800	34,700	90	3000
			22064-0	▢★	CDM EliteMW 315/T9/942/U/E	C182/E	12	G, Clear, Fadeblock	3½	7½	30,000	36,200	32,600	90	4200
MasterColor CDM Elite MW (Medium Watt) Ceramic Metal Halide Tubular Single-Ended T12 Lamps (391, 392, 396, 397)															
Open or Enclosed luminaires; lifetime color stability within ±200K⌘															
210	T12	PGZX18	23806-3	▢★	CDM EliteMW 210/T12/930/U/O	C183/O	12	G, Clear, Fadeblock	3½	7½	20,000	23,100	20,700	90	3000
			23808-9	▢★	CDM EliteMW 210/T12/942/U/O	C183/O	12	G, Clear, Fadeblock	3½	7½	20,000	22,100	19,900	90	4200
315	T12	PGZX18	23807-1	▢★	CDM EliteMW 315/T12/930/U/O	C182/O	12	G, Clear, Fadeblock	3½	7½	20,000	36,200	32,500	90	3000
			23809-7	▢★	CDM EliteMW 315/T12/942/U/O	C182/O	12	G, Clear, Fadeblock	3½	7½	20,000	34,700	31,200	90	4200
MasterColor Ceramic Metal Halide Tubular Double-Ended Lamps (374, 391, 392, 396)															
Double-Ended TD6 & TD7 Style; enclosed luminaires only; lifetime color stability within ±200K															
70	TD6	RX7s	23160-5	★	CDM70/TD/830	C139/C85/E	12	G, Clear, FadeBlock, Hor. ± 45°	2¼	4⅛	15,000	6500	5200	82	3000
150	TD7	RX7s	23167-0	★	CDM150/TD/830	C142/C102/ C81E	12	G, Clear, FadeBlock, Hor. ± 45°	2⅞	5⅞	15,000	13,250	11,260	88	3000
MasterColor CDM Warm Ceramic Metal Halide Tubular Single-Ended T6 Lamps (391, 392, 396, 397)															
Enclosed luminaires only; lifetime color stability within ±200K															
70	T6	G12	42169-3	★	CDM-T Warm 70W/925	C139/E	12	G, Clear, FadeBlock	2½	3⅛	15,000	6500	5650	92	2600
MasterColor CDM Fresh Ceramic Metal Halide Tubular Single-Ended T6 Lamps (391, 392, 396, 397)															
Enclosed luminaires only; lifetime color stability within ±200K															
70	T6	G12	41901-0	★	CDM-T FRESH 70W/740	C139/E	12	G, Clear, FadeBlock	2½	3⅛	15,000	6000	5000	70	4000


T6
G12


T9
PGZ18

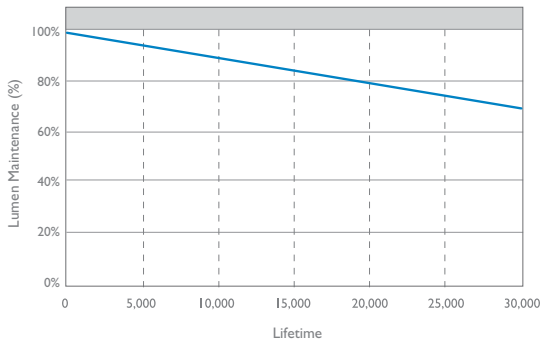

T12
PGZX18


TD
RX7s


PAR38 Integrated
Med.

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Maintenance Curve
Philips MasterColor Elite MW 315W Lamps



High Intensity Discharge Lamps

MasterColor Ceramic Metal Halide Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref. or MBCP▯	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
MasterColor Integrated PAR Lamps (396, 406)															
These lamps may be used in open fixtures; do not use in totally enclosed recessed fixtures															
25	PAR38	Med.	14477-4	▢★●	CDM-i25W/830/ PAR38/10/ALTO	MBCP = 26,000	6	G, PAR Spot 10°	—	5½	15,000	1450	1015	87	3000
			14478-2	▢★●	CDM-i25W/830/ PAR38/25/ALTO	MBCP = 5600	6	G, PAR Flood 25°	—	5½	15,000	1450	1015	87	3000
			14479-0	▢★●	CDM-i25W/830/ PAR38/40/ALTO	MBCP = 2100	6	G, PAR W. Flood 40°	—	5½	15,000	1450	1015	87	3000
Protected MasterColor Ceramic Metal Halide R111 Lamps (391, 392, 396, 397)															
Open or Enclosed luminaires; lifetime color stability within ±200K															
39	R111	GX8.5	13554-1	▢★	CDM-R111/35W/ 830 10DG	C130/O MBCP=35,000	6	G, R111, Spot 10°	—	3¾	12,000	1100	720	81	3000
			13556-6	▢★	CDM-R111/35W/ 830 24DG	C130/O MBCP=8500	6	G, R111, N. Flood 24°	—	3¾	12,000	1350	880	81	3000
			13921-2	▢★	CDM-R111/35W/ 830 40DG	C130/O MBCP=4000	6	G, R111, Flood 40°	—	3¾	12,000	1350	880	81	3000
70	R111	GX8.5	14754-6	▢★	CDM-R111/70W/ 830 10DG	C139/O MBCP=50,000	6	G, R111, Spot 10°	—	3¾	12,000	2500	1625	84	3000
			14755-3	▢★	CDM-R111/70W/ 830 24DG	C139/O MBCP=15,000	6	G, R111, N. Flood 24°	—	3¾	12,000	2850	1850	84	3000
			14795-8	▢★	CDM-R111/70W/ 830 40DG	C139/O MBCP=9000	6	G, R111, Flood 40°	—	3¾	12,000	2850	1850	84	3000
Protected MasterColor Elite Ceramic Metal Halide MR16 Lamps (391, 392, 396, 397)															
Open or Enclosed luminaires; lifetime color stability within ±200K															
20	MR16	GX10	42165-1	★	CDM-MR16/20W/ 830/10D ELITE	C156/O MBCP=13,500	12	G, MR16 Spot 10°	—	2⅜	15,000	1050	880	85	3000
			42166-9	★	CDM-MR16/20W/ 830/25D ELITE	C156/O MBCP=4500	12	G, MR16 Flood 25°	—	2⅜	15,000	1050	880	85	3000
			42167-7	★	CDM-MR16/20W/ 830/40D ELITE	C156/O MBCP=2100	12	G, MR16 W. Flood 40°	—	2⅜	15,000	1050	880	85	3000
39	MR16	GX10	41893-9	★	CDM-MR16/35W/ 930/10D ELITE	C130/O MBCP=18,000	12	G, MR16 Spot 10°	—	2⅜	15,000	2400	2200	90	3000
			41894-7	★	CDM-MR16/35W/ 930/25D ELITE	C130/O MBCP=8000	12	G, MR16 Flood 25°	—	2⅜	15,000	2400	2200	90	3000
			41895-3	★	CDM-MR16/35W/ 930/40D ELITE	C130/O MBCP=3900	12	G, MR16 W. Flood 40°	—	2⅜	15,000	2400	2200	90	3000
50	MR16	GX10	41553-9	★†▢	CDM-MR16/50W/ 930/25D ELITE	C193/O MBCP=11,500	12	G, MR16 Flood 25°	—	2⅜	12,000	3500	3200	90	3000
			41554-7	★▢	CDM-MR16/50W/ 930/40D ELITE	C193/O MBCP=7000	12	G, MR16 W. Flood 40°	—	2⅜	12,000	3500	3200	90	3000

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Protected MasterColor Ceramic Metal Halide PAR Lamps (391, 392, 396)

Open or enclosed luminaires; lifetime color stability within ±200K

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
22	PAR20	Med.	21151-6	★ ●	CDM20/PAR20/ M/SP/3K/ALTO	C156/C175/O MBCP=18,000	12	G, PAR WISO Spot 10° (397)	—	3¾	9000	940	600	81	3000
			21152-4	★ ●	CDM20/PAR20/ M/FL/3K/ALTO	C156/C175/O MBCP=2800	12	G, PAR WISO Flood 30° (397)	—	3¾	9000	980	615	81	3000
	PAR30L	Med.	21149-0	★ ●	CDM20/PAR30L/ M/SP/3K/ALTO	C156/C175/O MBCP=32,000	6	G, PAR WISO Spot 10° (397)	—	4¾	9000	1200	750	81	3000
			21140-9	★ ●	CDM20/PAR30L/ M/FL/3K/ALTO	C156/C175/O MBCP=4625	6	G, PAR WISO Flood 25° (397)	—	4¾	9000	1200	750	81	3000
39	PAR20	Med.	23365-0	★ ●	CDM35/PAR20/ M/SP/3K/ALTO	C130/O MBCP=23,000	12	G, PAR WISO Spot 10° (397)	—	3¾	9000	2000	1300	81	3000
			23364-3	★ ●	CDM35/PAR20/ M/FL/3K/ALTO	C130/O MBCP=5000	12	G, PAR WISO Flood 30° (397)	—	3¾	9000	2000	1300	81	3000
			15140-7	★ ●	CDM35/PAR20/ M/SP/4K/ALTO	C130/O MBCP=21,500	12	G, PAR WISO Spot 10° (397)	—	3¾	6000	1950	1650	92	4000
			15141-5	★ ●	CDM35/PAR20/ M/FL/4K/ALTO	C130/O MBCP=5000	12	G, PAR WISO Flood 30° (397)	—	3¾	6000	1950	1650	92	4000
	PAR30L	Med.	22329-7	★ ●	CDM35/PAR30L/ M/SP/3K/ALTO	C130/O MBCP=44,000	6	G, PAR WISO Spot 10° (397)	—	4¾	11,000	2200	1430	81	3000
			22330-5	★ ●	CDM35/PAR30L/ M/FL/3K/ALTO	C130/O MBCP=9300	6	G, PAR WISO Flood 25° (397)	—	4¾	11,000	2200	1430	81	3000
70	PAR30L	Med.	23224-9	★ ●	CDM70/PAR30L/ M/SP/3K/ALTO	M143/M98/O MBCP=66,000	6	G, PAR WISO Spot 10°	—	4¾	12,000	5000	3050	83	3000
			23221-5	★ ●	CDM70/PAR30L/ M/FL/3K/ALTO	M143/M98/O MBCP=10,000	6	G, PAR WISO Flood 40°	—	4¾	12,000	5000	3050	83	3000
			15142-3	★ ●	CDM70/PAR30L/ M/SP/4K/ALTO	C139/O MBCP=63,000	6	G, PAR WISO Spot 10°	—	4¾	12,000	4300	3010	94	4000
			15143-1	★ ●	CDM70/PAR30L/ M/FL/4K/ALTO	C139/O MBCP=9000	6	G, PAR WISO Flood 40°	—	4¾	12,000	4300	3010	94	4000
	PAR38	Med.	22250-5	★ ●	CDM70/PAR38/ SP/3K/ALTO	M143/M98/O MBCP=42,000	12	G, PAR WISO Spot 15° (399)	—	5⅞	12,500	4100	2870	85	3000
			22249-7	★ ●	CDM70/PAR38/ FL/3K/ALTO	M143/M98/O MBCP=16,000	12	G, PAR WISO Flood 25° (399)	—	5⅞	12,500	4100	2870	85	3000
			28872-0	▢ ★ ●	CDM70/PAR38/ SP/4K/ALTO	M143/M98/O MBCP=40,000	12	G, PAR WISO Spot 15° (399)	—	5⅞	12,500	3700	2590	92	4000
			28873-8	▢ ★ ●	CDM70/PAR38/ FL/4K/ALTO	M143/M98/O MBCP=13,000	12	G, PAR WISO Flood 25° (399)	—	5⅞	12,500	3700	2590	92	4000
100	PAR38	Med.	24477-2	★ ●	CDM100/PAR38/ SP/3K/ALTO	M140/M90/O MBCP=55,000	12	G, PAR WISO Spot 15° (399)	—	5⅞	12,500	6200	4340	85	3000
			24476-4	★ ●	CDM100/PAR38/ FL/3K/ALTO	M140/M90/O MBCP=22,000	12	G, PAR WISO Flood 25° (399)	—	5⅞	12,500	6200	4340	85	3000
			28876-1	▢ ★ ●	CDM100/PAR38/ SP/4K/ALTO	M140/M90/O MBCP=50,000	12	G, PAR WISO Spot 15°(399)	—	5⅞	12,500	5700	3990	92	4000
			28878-7	▢ ★ ●	CDM100/PAR38/ FL/4K/ALTO	M140/M90/O MBCP=19,000	12	G, PAR WISO Flood 25° (399)	—	5⅞	12,500	5700	3990	92	4000

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PAR20
Med.


PAR30L
Med.


PAR38
Med.

High Intensity Discharge Lamps

MasterColor Ceramic Metal Halide Lamps

Protected MasterColor Ceramic Metal Halide Lamps (391, 392, 396, 399)

ED17P sleeved arc tube; open or enclosed luminaires; lifetime color stability within ±200K; pulse start

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
50	ED17P	Med.	42368-1	★†	MHC50/U/MP/3K ELITE	M148/M110/O	12	G, Clear, FadeBlock	3⅞	5⅞	20,000	4800	3840	90	3000
			42994-4	★†	MHC50/U/MP/4K/ELITE	M148/M110/O	12	G, Clear, FadeBlock	3⅞	5⅞	20,000	4645	3716	92	4000
70	ED17P	Med.	42370-7	★†	MHC70/U/MP/3K ELITE	M143/M98/O	12	G, Clear, FadeBlock	3⅞	5⅞	20,000	6700	5360	90	3000
			42369-9	★†	MHC70/C/U/MP/3K ELITE	M143/M98/O	12	G, Coated, FadeBlock	—	5⅞	20,000	6100	4880	90	3000
			42995-0	★†	MHC70/U/MP/4K/ELITE	M143/M98/O	12	G, Clear, FadeBlock	3⅞	5⅞	20,000	6189	4951	93	4000
			42997-6	★†	MHC70/C/U/MP/4K/ELITE	M143/M98/O	12	G, Coated, FadeBlock	—	5⅞	20,000	5896	4717	93	4000
100	ED17P	Med.	42367-3	★†	MHC100/U/MP/3K ELITE	M140/M90/O	12	G, Clear, FadeBlock	3⅞	5⅞	20,000	10,000	8000	90	3000
			42371-5	★†	MHC100/C/U/MP/3K ELITE	M140/M90/O	12	G, Coated, FadeBlock	—	5⅞	20,000	9200	7360	90	3000
			42993-6	★†	MHC100/U/MP/4K/ELITE	M140/M90/O	12	G, Clear, FadeBlock	3⅞	5⅞	20,000	9249	7399	93	4000
			42996-8	★†	MHC100/C/U/MP/4K/ELITE	M140/M90/O	12	G, Coated, FadeBlock	—	5⅞	20,000	8750	7000	93	4000
150	ED17P	Med.	13463-5	★	MHC150/U/MP/3K	M142/M102/O	12	G, Clear, FadeBlock	3⅞	5⅞	16,000	12,900	9545	85	3000
			13464-3	★	MHC150/C/U/MP/3K	M142/M102/O	12	G, Coated, FadeBlock	—	5⅞	16,000	11,900	8805	85	3000
			37724-2	★	MHC150/U/MP/4K	M142/M102/O	12	G, Clear, FadeBlock	3⅞	5⅞	20,000	12,000	9000	92	4000
			37726-7	▢★	MHC150/C/U/MP/4K	M142/M102/O	12	G, Coated, FadeBlock	—	5⅞	20,000	11,000	8250	92	4000

MasterColor Ceramic Metal Halide ED17, ED28 Lamps (391, 392, 399)

Enclosed luminaires only; lifetime color stability within ±200K; pulse start

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
50	ED17	Med.	41949-9	★†	MHC50/U/M/3K ELITE	M148/M110/E	12	G, Clear	3⅞	5⅞	20,000	5500	4400	90	3000
			41950-7	★†	MHC50/C/U/M/3K ELITE	M148/M110/E	12	G, Coated	—	5⅞	20,000	5200	4160	90	3000
			42992-8	★†	MHC50/U/M/4K ELITE	M148/M110/E	12	G, Clear	3⅞	5⅞	20,000	4779	3823	88	4000
			42987-8	★†	MHC50/C/U/M/4K ELITE	M148/M110/E	12	G, Coated	—	5⅞	20,000	3544	2835	83	4000
70	ED17	Med.	41947-3	★†	MHC70/U/M/3K ELITE	M143/M98/E	12	G, Clear	3⅞	5⅞	20,000	7700	6100	90	3000
			41948-1	★†	MHC70/C/U/M/3K ELITE	M143/M98/E	12	G, Coated	—	5⅞	20,000	7300	5800	90	3000
			42990-2	★†	MHC70/U/M/4K/ELITE	M143/M98/E	12	G, Clear	3⅞	5⅞	20,000	6630	5304	89	4000
			42991-0	★†	MHC70/C/U/M/4K/ELITE	M143/M98/E	12	G, Coated	—	5⅞	20,000	6149	4919	88	4000
100	ED17	Med.	41951-5	★†	MHC100/U/M/3K ELITE	M140/M90/E	12	G, Clear	3⅞	5⅞	20,000	11,000	9350	85	3000
			41952-3	★†	MHC100/C/U/M/3K ELITE	M140/M90/E	12	G, Coated	—	5⅞	20,000	10,200	8670	85	3000
			42988-6	★†	MHC100/U/M/4K/ELITE	M140/M90/E	12	G, Clear	3⅞	5⅞	20,000	9955	7964	93	4000
			42989-4	★†	MHC100/C/U/M/4K/ELITE	M140/M90/E	12	G, Coated	—	5⅞	20,000	9530	7624	93	4000
	ED28	Mog.	43070-2	▢★	MHC100/U/ED28/HR/4K	M140/M90/E	12	G, Clear (372, 377, 378)	5	8⅝	20,000	10,000	8000	90	4100
150	ED17	Med.	13022-9	★	MHC150/U/M/3K	M142/M102/E	12	G, Clear	3½	5⅞	16,000	14,000	10,500	85	3000
			13023-7	★	MHC150/C/U/3K	M142/M102/E	12	G, Coated	—	5⅞	16,000	12,500	9375	85	3000
			37720-0	★	MHC150/U/M/4K	M142/M102/E	12	G, Clear	3⅞	5⅞	20,000	13,000	9750	92	4000
			37721-8	★	MHC150/C/U/M/4K	M142/M102/E	12	G, Coated	—	5⅞	20,000	12,000	9000	92	4000

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ED17P Med.

ED17 Med.

ED28 Mog.

High Intensity Discharge Lamps

MasterColor Ceramic Metal Halide, CosmoWhite, Energy Advantage Ceramic Metal Halide Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
MasterColor Ceramic Metal Halide Pulse Start ED23.5 Lamps (391, 392, 399)															
Enclosed luminaires only; lifetime color stability within ±200K; pulse start															
70	ED23½	Mog.	43069-4	❑■★●	CDM70/U/PS/4k ELITE	M143/M98/E	12	G, Clear	5	7¾	20,000	6800	5440	88	4400
100	ED23½	Mog.	43068-6	❑■★●	CDM100/U/PS/4K ELITE	M140/M90/E	12	G, Clear	5	7¾	20,000	9900	7920	91	4200
150	ED23½	Mog.	15494-8	❑■★●	CDM150/U/PS/4K ALTO	M142/M102/E	12	G, Clear	5	7¾	24,000	13,000	9360	85	4000
CosmoWhite (391, 392, 396, 397)															
Enclosed luminaires only; lifetime color stability within ±200K (HOR = Horizontal Operation ± 15°)															
45	T6	PGZ12	41889-7	★❑†	CPO-T WHITE 45W/728	TBD	12	G, Clear, FadeBlock, Horiz. ±15°	2⅛	5⅛	30,000*	4950	4400	70	2800
60	T6	PGZ12	15731-3	★❑	CPO-T WHITE 60W/728	C187/E	12	G, Clear, FadeBlock, Horiz. ±15°	2⅛	5⅛	30,000*	7200	6400	70	2800
			41884-8	★❑†	CPO-T WHITE 60W/840	C187/E	12	G, Clear, FadeBlock, Horiz. ±15°	2⅛	5⅛	16,000	7020	6300	80	4000
90	T6	PGZ12	40604-1	★❑	CPO-T WHITE 90W/728	C188/E	12	G, Clear, FadeBlock, Horiz. ±15°	2⅜	5⅜	30,000*	10,450	8800	70	2800
			41794-9	★❑†	CPO-T WHITE 90W/840	C188/E	12	G, Clear, FadeBlock, Horiz. ±15°	2⅜	5⅜	15,000	10,350	9625	80	4000
140	T6	PGZ12	15732-1	★❑	CPO-T WHITE 140W/728	C189/E	12	G, Clear, FadeBlock, Horiz. ±15°	2⅜	5⅜	30,000*	16,500	14,520	70	2800
			41795-5	★❑†	CPO-T WHITE 140W/840	C189/E	12	G, Clear, FadeBlock, Horiz. ±15°	2⅜	5⅜	15,000	16,100	15,130	80	4000
Energy Advantage CDM with AllStart Technology ED17 Lamps (391, 392, 396, 397)															
Enclosed luminaires only; lifetime color stability within ±200K															
145	ED17	Med.	41106-6	★❑†	CDM145/U/M/4K/ ED17 EA AllStart	C192/E**	12	G, Clear, Fadeblock	3⅞	5⅞	20,000	13,340	10,670	>80	4300
			41320-3	★❑†	CDM145/C/U/M/4K/ ED17 EA AllStart	C192/E**	12	G, Coated, Fadeblock	—	5⅞	20,000	12,300	9840	>80	4300

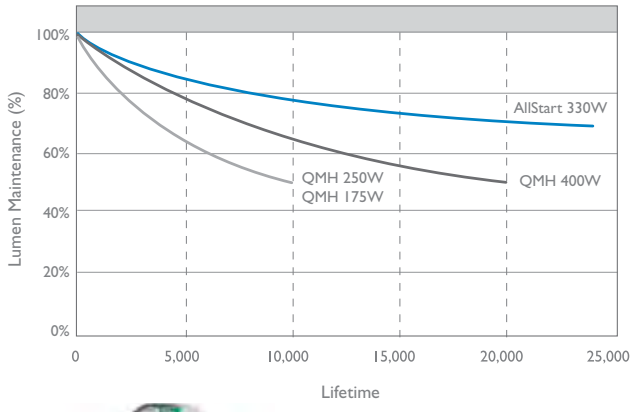
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* 30,000 horizontal application but 20,000 vertical application

** 145W compatible with M57 probe start ballast. Also compatible with M152 pulse start ballasts

Maintenance Curve

Philips Energy Advantage CDM 330W Lamps with AllStart Technology



Energy Advantage Lamp Comparisons

Philips Energy Advantage CDM Lamp with AllStart Technology	Standard Metal Halide Lamp Replacement
145W Energy Advantage CDM Lamp	175W Standard Metal Halide Lamp
205W Energy Advantage CDM Lamp	250W Standard Metal Halide Lamp
260W Energy Advantage CDM Lamp	320W Standard Metal Halide Lamp
330W Energy Advantage CDM Lamp	400W Standard Metal Halide Lamp
860W Energy Advantage CDM Lamp	1000W Standard Metal Halide Lamp



High Intensity Discharge Lamps

Energy Advantage Ceramic Metal Halide Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
Energy Advantage CDM with AllStart Technology (391, 392, 396, 397)⌘															
Open or Enclosed luminaires; lifetime color stability within ±200K															
145	ED28	EX39 Excl. Mog.	41107-4	★ ⬡	CDM145/U/O/4K/ ED28 EA AllStart	C192/O[1]	12	G, Clear, Fadeblock	5	8⅝	20,000	13,775	11,020	87	4000
			41319-5	★ ⬡	CDM145/C/U/O/4K/ ED28 EA AllStart	C192/O[1]	12	G, Coated, Fadeblock	—	8⅝	20,000	12,615	10,090	87	4000
205	ED28	EX39 Excl. Mog.	23256-1	★ ⬡	CDM205/U/O/4K EA AllStart	C184/O[2]	12	G, Clear, Fadeblock	5	8⅝	20,000	19,500	15,600	85	4100
			23692-7	★ ⬡	CDM205/C/U/O/4K EA AllStart	C184/O[2]	12	G, Coated, Fadeblock	—	8⅝	20,000	18,000	14,400	85	4100
260	ED28	EX39 Excl. Mog.	41937-4	★ ⬡ †	CDM260/U/O/4K EA AllStart	C195/O[4]	12	G, Clear, Fadeblock	5	8⅝	20,000	27,000	21,600	90	4000
			41936-6	★ ⬡ †	CDM260/C/U/O/4K EA AllStart	C195/O[4]	12	G, Coated, Fadeblock	—	8⅝	20,000	25,300	20,300	90	4000
330	ED28	EX39 Excl. Mog.	41105-8	★ ⬡	CDM330/U/O/4K/ED28 EA AllStart	C185/O[3]	12	G, Clear, Fadeblock	5	8⅝	20,000	33,000	26,400	90	4000
	ED37	EX39 Excl. Mog.	23259-5	★ ⬡	CDM330/U/O/4K EA AllStart	C185/O[3]	6	G, Clear, Fadeblock	7	11½	24,000	33,000	24,750	90	4000
			23693-5	★ ⬡	CDM330/C/U/O/4K EA AllStart	C185/O[3]	6	G, Coated, Fadeblock	—	11½	24,000	31,000	23,250	90	4000
Open or Enclosed luminaires; lifetime color stability within ±200K; (V = Vertical Operation ±15°)															
860	BT37	EX39 Excl. Mog.	42178-4	★ ⬡ †	CDM860/V/O/4K/BT37 EA AllStart	C194/O[5]	6	G, Clear, Fadeblock	7	11½	20,000	82,000	65,000	92	3700
	BT56	EX39 Excl. Mog.	42179-2	★ ⬡ †	CDM860/V/O/4K/BT56 EA AllStart	C194/O[5]	6	G, Clear, Fadeblock	9½	15⅜	20,000	82,000	65,000	92	3700
Energy Advantage CDM Long Life Lamp with AllStart Technology (391, 392, 396, 397)															
Open or Enclosed luminaires; lifetime color stability within ±200K; (V = Vertical Operation ±15°)															
330	ED37	EX39 Excl. Mog.	42177-6	★ ⬡ †	CDM330/V/O/4K/LL EA AllStart	C185/O[4]	6	G, Clear, Fadeblock	7	11½	36,000	32,950	23,100	90	4000

1) 145W compatible with M57 probe start ballast. Also compatible with M152 pulse start ballasts
2) 205W compatible with M58 probe start ballast. Also compatible with M138 and M153 pulse start ballasts
3) 330W compatible with M59 probe start ballast. Also compatible with M128, M135, M155, and M172 pulse start ballasts
4) 260W compatible with M154 and M132 pulse start ballasts
5) 860W compatible with M47 probe start ballast. Also compatible with M141 pulse start ballast

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Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
Protected Pulse Start Metal Halide "O" Rated Lamps (372, 374, 391)															
Open or enclosed luminaires; pulse start metal halide is designed for operation on only specified ANSI compatible ballasts with metal halide pulse ignitors⌘															
175	ED28	EX39 Excl.Mog.	20755-5	■★	MP175/BU/PS	M152/ M137/O	12	G, Clear, Base Up ± 15° Pulse Start	5	8⁵⁄₁₆	14,000	16,000	11,200	62	3500
250	ED28	EX39 Excl.Mog.	20756-3	■★	MP250/BU/PS	M153/ M138/O	12	G, Clear, Base Up ± 15° Pulse Start	5	8⁵⁄₁₆	14,000	23,000	16,100	62	3800
320	ED37	EX39. Excl.Mog.	13039-3	■★	MP320/BU/PS	M154/ M132/O	6	G, Clear, Base Up ± 15° Pulse Start	7	11½	20,000	29,500	20,650	65	3800
			13040-1	■★	MP320/C/BU/PS	M154/ M132/O	6	G, Coated Base Up ± 15° Pulse Start	—	11½	20,000	27,200	19,040	65	3700
350	ED37	EX39 Excl.Mog.	39101-1	■★	MP350/BU/PS	M131/O	6	G, Clear, Base Up ± 15° Pulse Start	7	11½	20,000	34,000	23,800	64	4000
400	ED37	EX39 Excl.Mog.	13334-8	■★	MP400/BU/PS	M155/M128/ M135/O	6	G, Clear, Base Up ± 15° Pulse Start	7	11½	20,000	40,000	28,000	65	3800
			13335-5	■★	MP400/C/BU/PS	M155/M128/ M135/O	6	G, Coated Base Up ± 15° Pulse Start	—	11½	20,000	36,000	23,400	68	3600
750	BT37	EX39 Excl.Mog.	20757-1	■★	MP750/BU/PS	M149/O	6	G, Clear, Base Up ± 15° Pulse Start	7	11½	12,000	70,000	49,000	70	3800

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ED28
EX-39


ED37
EX-39


BT37
EX-39

High Intensity Discharge Lamps

Metal Halide Lamps

Pulse Start Metal Halide Lamps (372, 374, 391)

Enclosed luminaires only unless otherwise noted; base up operation ± 15° unless otherwise noted.

Pulse start metal halide is designed for operation on only specified ANSI compatible ballasts with metal halide pulse ignitors.

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
175	ED17	Med.	23249-6	■★	MS175/M/BU/PS	M152/M137/E	12	G, Base Up ±15°, Pulse Start	3⅞	5⅞	15,000	17,500	12,250	68	4000
	ED28	Mog.	27662-6	■★	MS175/BU/PS	M152/M137/E	12	G, Base Up ±15°, Pulse Start	5	8⅜	15,000	16,000	11,200	62	3700
			20751-4	▢■★	MS175/HOR/PS	M152/M137/E	12	G, Clear, Horizontal, Pulse Start	5	8⅜	11,500	12,800	8960	62	4200
200	ED28	Mog.	23250-4		MS200/BU/PS	M136/E	12	G, Base Up ±15°, Pulse Start	5	8⅜	15,000	21,000	14,700	68	4000
250	ED28	Mog.	27661-8	■★	MS250/BU/PS	M153/M138/E	12	G, Base Up ± 15°, Pulse Start	5	8⅜	15,000	23,750	16,625	65	4300
			23280-1	▢■★	MS250/U/PS	M153/M138/E	12	G, Clear, Universal, Pulse Start (385)	5	8⅜	12,000	22,000	15,400	62	3800
320	ED28	Mog.	38381-0	■★	MS320/U/PS	M154/M132/E	12	G, Clear, Pulse Start (385)	5	8⅜	20,000	30,000	21,000	62	4100
350	ED37	Mog.	38387-7	■★	MS350/BU/PS	M131/E	6	G, Clear, Base Up ± 15°, Pulse Start	7	11½	20,000	36,000	25,200	62	4000
400	ED28	Mog.	23252-0		MS400/BU/ED28/PS	M155/M128/ M135/E	12	G, Base Up ±15°, Pulse Start	5	8⅜	20,000	44,000	30,800	68	4000
			23253-8		MS400/HOR/ED28/PS	M155/M128/ M135/E	12	G, Clear, Horizontal, Pulse Start	5	8⅜	20,000	40,000	28,000	68	4000
	ED37	Mog.	23283-5	■★	MS400/U/PS	M155/M135/ M128/E	6	G, Clear, Universal, Pulse Start (385)	7	11½	15,000	40,000	28,000	62	3800
750	BT37	Mog.	13540-0	■★	MS750/BU/BT37/PS	M149/E	6	G, Clear, Base Up ± 15°, Pulse Start	7	11½	16,000	82,000	61,500	65	4000
			20754-8	▢■★	MS750/HOR/BT37/PS	M149/E	6	G, Clear, Horizontal, Pulse Start	7	11½	12,000	68,000	47,600	65	4000
1000	BT37	Mog.	36019-8	■★	MS1000/BU/BT37/PS	M141/E	6	G, Clear, Base Up ± 15°, Pulse Start	7	11½	15,000	120,000	96,000	65	3700

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Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
Protected Metal Halide "O" Rated Lamps (372, 374, 377)⌘															
Open or enclosed luminaires															
175	ED28	EX39	28119-6	■★	MP175/BU	M57/O	12	G, Clear, Base Up ±15°	5	8⅝	10,000	15,000	12,000	65	3800
		Excl.Mog.													
250	ED28	EX39	28124-6	■★	MP250/BU	M58/O	12	G, Clear, Base Up ±15°	5	8⅝	10,000	22,000	16,500	62	3800
		Excl.Mog.													
360	ED37	EX39	13067-4	■★	MP360BU/EW	M165/M59/O	6	G, Clear, Base Up ±15°	7	11½	20,000	34,200	23,940	65	4000
		Excl.Mog.	13068-2	■★	MP360/C/BU/EW	M165/M59/O	6	G, Coated, Base Up ±15°	—	11½	20,000	31,700	20,605	68	3600
400	ED37	EX39	13332-2	■★	MP400/BU	M59/O	6	G, Clear, Base Up ±15°	7	11½	20,000	38,000	26,600	65	4000
		Excl.Mog.	13333-0	■★	MP400/C/BU	M59/O	6	G, Coated, Base Up ±15°	—	11½	20,000	34,500	22,425	67	3700
1000	BT56	EX39	28118-8	■★	MP1000/BU	M47/O	6	G, Clear, Base Up ±15°	9½	15⅜	12,000	107,000	75,000	65	3900
		Excl.Mog.													
Double-Ended Metal Halide Lamps (374, 387, 393)															
Enclosed luminaires (387)															
1800	TD	PSFc20-6/	31360-1		MHD1800W	—	4	Sports Ltg. Spot Horizontal ± 15°	4¼	14	4500	150,000	—	92	5600
	Special	SFc20-6													

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High Intensity Discharge Lamps

Metal Halide Lamps, MasterColor Ceramic Metal Halide Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
Metal Halide Lamps (372)															
Enclosed luminaires only															
150	BD17	Med.	35462-1	★	MH150/U/M	M107/E	12	G, Clear (385, 400)	3⅞	5⅛	10,000	12,500	8500	65	3700
			35463-9	★	MH150/C/U/M	M107/E	12	G, Coated (385, 400)	—	5⅛	10,000	12,000	7900	65	3400
175	BD17	Med.	31358-5	★	MH175/U/M	M57/E	12	G, Clear (377, 385, 393)	3⅞	5⅛	10,000	13,500	9100	65	4000
			31359-3	★	MH175/C/U/M	M57/E	12	G, Coated (377, 385)	—	5⅛	10,000	13,000	8380	65	3700
	ED28	Mog.	28733-4	★	MH175/U	M57/E	12	G, S, Clear (377, 385, 393)	5	8⅛	10,000	13,500	8775	65	4000
			28728-4	★	MH175/C/U	M57/E	12	G, S, Coated (374, 377, 385)	—	8⅛	10,000	13,000	8200	70	3700
250	ED28	Mog.	27484-5	★	MH250/U	M58/E	12	G, S, Clear (377, 385, 393)	5	8⅛	10,000	20,500	13,500	65	4000
			29169-0	★	MH250/C/U	M58/E	12	G, S, Coated (377, 385, 393)	—	8⅛	10,000	19,475	12,500	70	3700
400	ED28	Mog.	42602-3	□★	MH400/U/ED28	M59/E	12	G, Clear (377, 385, 393)	5	8⅛	20,000	36,000	24,000	63	4000
	ED37	Mog.	27449-8	□★	MH400/U	M59/E	6	G, S, Clear (377, 385, 393)	7	11½	20,000	39,000	25,350	65	3900
			41520-8	□★	MH400/C/U	M59/E	6	G, S, Coated (377, 385, 393)	—	11½	20,000	38,000	22,800	65	3600
1000	BT37	Mog.	32150-5	★	MH1000/U/BT37	M47/E	6	G, Clear (359, 377, 385, 393)	7	11½	10,000	110,000	71,500	65	3700
	BT56	Mog.	41522-4	□★	MH1000/U	M47/E	6	G, S, Clear (377, 385, 393)	9½	15⅜	12,000	114,000	79,800	65	3900
			41523-2	□★	MH1000/C/U	M47/E	6	G, S, Coated (377, 385, 393)	—	15⅜	12,000	110,000	77,000	65	3500
1500	BT56	Mog.	13162-3	★	MH1500/U	M48/E	6	G, S, Clear (359, 374, 375, 377, 402)	9½	15⅜	6000	172,000	137,600	60	4000

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Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
Mini White SON High Pressure Sodium Lamps (360, 376)															
Incandescent color quality, GX12-1 base compact high pressure sodium lamps to be operated on Advance eVision IWSN100CLF and IWSN100CBLS electronic ballast only															
100	T6	GX12-1	13425-4	▢★	SDW-TG 100W/T6/825	S167	12	G	2⅛	4½	10,000	4900	4165	83	2550
Ceramalux High Pressure Sodium Lamps (360, 373)															
Featuring ALTO Lamp Technology															
35	BD17	Med.	40979-7	★	C35S76/M	S76	12	G (376)	3⅞	5⅞	24,000+	2250	2025	21	2100
50	BD17	Med.	40980-5	★	C50S68/M	S68	12	G (376)	3⅞	5⅞	24,000+	4000	3600	21	2100
	ED23½	Mog.	36867-0	★●	C50S68/ALTO	S68	12	G, S (376)	5	7¾	24,000+	4000	3600	21	2100
70	BD17	Med.	33192-6	★	C70S62/M	S62	12	G (376)	3⅞	5⅞	24,000+	6300	5850	21	2100
			33214-8	★	C70S62/D/M	S62	12	G (376)	—	5⅞	24,000+	5860	5270	21	2100
	ED23½	Mog.	36869-6	★●	C70S62/ALTO	S62	12	G, S (376)	5	7¾	24,000+	6500	5670	21	2100
100	BD17	Med.	34446-5	★	C100S54/M	S54S	12	G (376)	3½	5⅞	24,000+	9500	8550	21	2100
			34448-1	★	C100S54/D/M	S54S	12	G (376)	—	5⅞	24,000+	8800	7920	21	2100
	ED23½	Mog.	36872-0	★●	C100S54/ALTO	S54	12	G, S (376)	5	7¾	24,000+	9400	8460	21	2100
			33227-0	★●	C100S54/D/ALTO	S54	12	G, S (376)	—	7¾	24,000+	8610	7750	21	2100
150	BD17	Med.	30347-9	★	C150S55/M	S55	12	G (376)	3½	5⅞	24,000+	16,000	14,400	21	2100
			30348-7	★	C150S55/D/M	S55	12	G (376)	—	5⅞	24,000+	15,000	13,500	21	2100
	ED23½	Mog.	36874-6	★●	C150S55/ALTO	S55	12	G, S (370, 376)	5	7¾	24,000+	15,800	14,220	21	2100
	ED28	Mog.	36876-1	★●	C150S56/ALTO	S56	12	G, S (370, 376)	5	8⅛	24,000+	15,000	13,950	21	2100
200	ED18	Mog.	36877-9	★●	C200S66/ALTO	S66MN-200	12	G, S (376)	5¾	9¾	24,000+	21,400	19,260	21	2100
250	ED18	Mog.	36879-5	★●	C250S50/ALTO	S50	12	G, S (376)	5¾	9¾	24,000+	27,000	24,300	21	2100
400	ED18	Mog.	36881-1	★●	C400S51/ALTO	S51	12	G, S (376)	5¾	9¾	24,000+	50,000	45,000	21	2100
600	T14	Mog.	23982-2	■★	C600S106	S106	12	G (376)	6⅞	11⅛	24,000+	90,000	81,000	21	2100
1000	ED25	Mog.	36883-7	■★●	C1000S52/ALTO	S52XB-1000	6	G, S (359, 362, 376)	8¾	15⅛	24,000	140,000	126,000	21	2100
	ED37	Mog.	32386-5	■★	C1000S52/ED37	S52	6	G, S (376)	7	11½	24,000	125,000	112,000	21	2100

For the most current product information, go to the e-catalog on **www.philips.com**
HID symbols and footnotes located on page 82



High Intensity Discharge Lamps

High Pressure Sodium Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
Ceramalux High Pressure Sodium Non-Cycling Lamps (360, 373, 376)															
Featuring ALTO Lamp Technology															
70	ED23½	Mog.	14739-7	★ ●	C70S62/ALTO NC HPS	S62	12	G, S	5	7¾	30,000	6300	5670	21	2100
100	ED23½	Mog.	14740-5	★ ●	C100S54/ALTO NC HPS	S54	12	G, S	5	7¾	30,000	10,000	9000	21	2100
150	ED23½	Mog.	14741-3	★ ●	C150S55/ALTO NC HPS	S55	12	G, S	5	7¾	30,000	16,000	14,400	21	2100
200	ED18	Mog.	15725-5	★ ●	C200S66/ALTO NC HPS	S66	12	G, S	5¾	9¾	30,000	22,000	19,800	21	2100
250	ED18	Mog.	14742-1	★ ●	C250S50/ALTO NC HPS	S50	12	G, S	5¾	9¾	30,000	28,500	25,650	21	2100
400	ED18	Mog.	14743-9	★ ●	C400S51/ALTO NC HPS	S51	12	G, S	5¾	9¾	30,000	50,000	45,000	21	2100
1000	ED25	Mog.	15726-3	★ ●	C1000S52/ALTO NC HPS	S52	6	G, S	8¾	15⅛	30,000	130,000	117,000	21	2100
Ceramalux High Pressure Sodium Instant Restrike Lamps (360, 373, 376)															
50	ED23½	Mog.	35467-0	■★	C50S68/2	S68	12	G, S	5	7¾	24,000+	3800	3450	21	2100
70	ED23½	Mog.	26541-3	■★	C70S62/2	S62	12	G, S	5	7¾	24,000+	5600	5050	21	2100
100	ED23½	Mog.	26560-3	■★	C100S54/2	S54	12	G, S	5	7¾	24,000+	9100	8190	21	2100
150	ED23½	Mog.	26561-1	■★	C150S55/2	S55	12	G, S	5	7¾	24,000+	15,600	14,000	21	2100
250	ED18	Mog.	37717-6	■★	C250S50/2	S50	12	G, S	5¾	9¾	24,000+	27,500	24,750	21	2100
400	ED18	Mog.	37688-9	■★	C400S51/2	S51	12	G, S	5¾	9¾	24,000+	49,000	44,000	21	2100
1000	ED25	Mog.	20412-3	■★	C1000S52/2	S52	6	G, S	8¾	15⅛	24,000+	140,000	126,000	21	2100

For the most current product information, go to the e-catalog on **www.philips.com**
HID symbols and footnotes located on page 82



High Pressure Sodium—Horticulture Lamps (360, 373)

- Enhanced spectrum Xtreme grow lamp
- Offers 22% more micromols**
- Excellent lumen maintenance at 97% (405)
- Features ALTO Lamp Technology, environmentally responsible lamps

Note: Best practice suggests grow lamps to be replaced at maximum 40% of their rated average life in order to maintain same level of growth-light on plants over time

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref. or MBCP▯	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	PPF	CCT (K)
400	T15	Mog.	40487-1	★†	SON-T PIA Gm Pw/400W	S51	12	AGRO (359, 362, 376)	6⅞	11⅛	24,000	58,500	52,650	725	2100
430	ED18	Mog.	31710-7	★	SON AGRO 430W	S145/S51	12	AGRO (389, 396)	5¾	9¾	16,000	54,000	48,600	670	2100
600	T15	Mog.	40488-9	★†	SON-T PIA Gm Pw/600W/230V	S106	12	AGRO (359, 362, 376)	6⅞	11⅛	16,000	88,500	84,100	1150	2100
			40489-7	★†	SON-T PIA Gm Pw/600W/347V	S106	12	AGRO (359, 362, 376)	6⅞	11⅛	16,000	88,000	83,600	1150	2100
			40490-5	★†	SON-T PIA Gm Pw/600W/480V	S106	12	AGRO (359, 362, 376)	6⅞	11⅛	16,000	88,000	83,600	1150	2100
1000	ED25	Mog.	14064-0	■★	C1000S52/AGROLITE XT	S52	6	AGRO (359, 362, 376)	8¾	15⅛	15,000	146,000	135,780	1850	2100

For the most current product information, go to the e-catalog on **www.philips.com**

HID symbols and footnotes located on page 82

** The micromol value expresses the amount of light particles (photons) between 400 and 700 nm that are sent out by a light source (=Photosynthetic Photon Flux) per second. The amount that the plant absorbs determines the rate of photosynthesis and as a result the rate of plant growth. Therefore, the micromol value is also called "growth-light." In general, an increase of 22% in growth-light means an increase of 22% in plant growth

Low Pressure Sodium Lamps—SOX

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
18	T17	D.C. Bay	23404-7	▯	SOX-E18	L69	12	Clear Base Up ± 110°	5½	8½	18,000	1800	1530	—	1700
35	T17	D.C. Bay	32781-7		SOX35	L70	12	Clear Base Up ± 110°	—	12⅜	18,000	4550	3870	—	1700
55	T17	D.C. Bay	32151-3		SOX55	L71	12	Clear Base Up ± 110°	9½	16¾	18,000	7800	6630	—	1700
90	T21	D.C. Bay	32152-1		SOX90	L72	12	Clear Horizontal ± 20°	—	20¾	18,000	14,300	12,155	—	1700
135	T21	D.C. Bay	32153-9		SOX135	L73	12	Clear Horizontal ± 20°	—	30½	18,000	22,600	19,210	—	1700
180	T21	D.C. Bay	15116-7		SOX180	L74	6	Clear Horizontal ± 20°	—	44⅛	18,000	32,000	22,400	—	1700

For the most current product information, go to the e-catalog on **www.philips.com**

HID symbols and footnotes located on page 82



High Intensity Discharge Lamps

Mercury Vapor Lamps

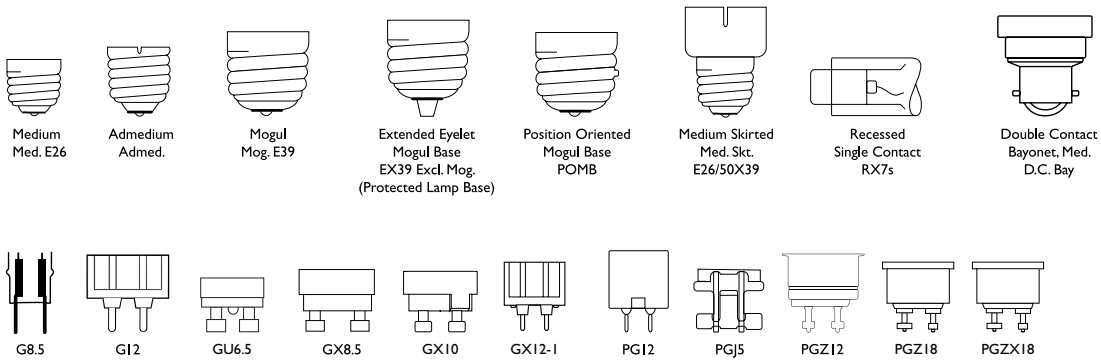
Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	ANSI Code Ballast Ref.	Pkg. Qty.‡	Description (401, 407)	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(351)	Approx. Initial Lumens(352)	Approx. Mean Lumens(353)	CRI	CCT (K)
Mercury Vapor Lamps															
100	A23	Med.	35658-4	★	H38MP-100/DX	H38	24	G (379)	—	5 7/16	24,000+	4300	3700	45	3700
	ED23½	Mog.	33713-9	★	H38JA-100/DX	H38	12	G, S (379)	—	7½	24,000+	4400	3400	45	3700
175	ED28	Mog.	31965-7	★	H39KB-175	H39	12	G, S (355)	5	8 7/16	24,000+	7900	7400	20	6800
	ED28	Mog.	24805-4	★	H39KC-175/DX	H39	12	G, S (379)	—	8 7/16	24,000+	7900	7600	45	3700
250	ED28	Mog.	31985-5	★	H37KB-250	H37	12	G, S (355)	5	8 7/16	24,000+	12,100	10,500	20	6700
	ED28	Mog.	24814-6	★	H37KC-250/DX	H37	12	G, S (379)	—	8 7/16	24,000+	13,000	10,700	45	3700
400	ED37	Mog.	24842-7	★	H33GL-400/DX	H33	6	G, S (379)	—	11½	24,000+	23,000	19,100	45	3700
1000	BT56	Mog.	39707-5	★	H36GW-1000/DX	H36	6	G, S (359, 379)	—	15⅜	24,000+	59,000	54,000	45	3600

Descriptive symbols for Mercury Vapor Lamps:
G—General Lighting
S—Street Lighting

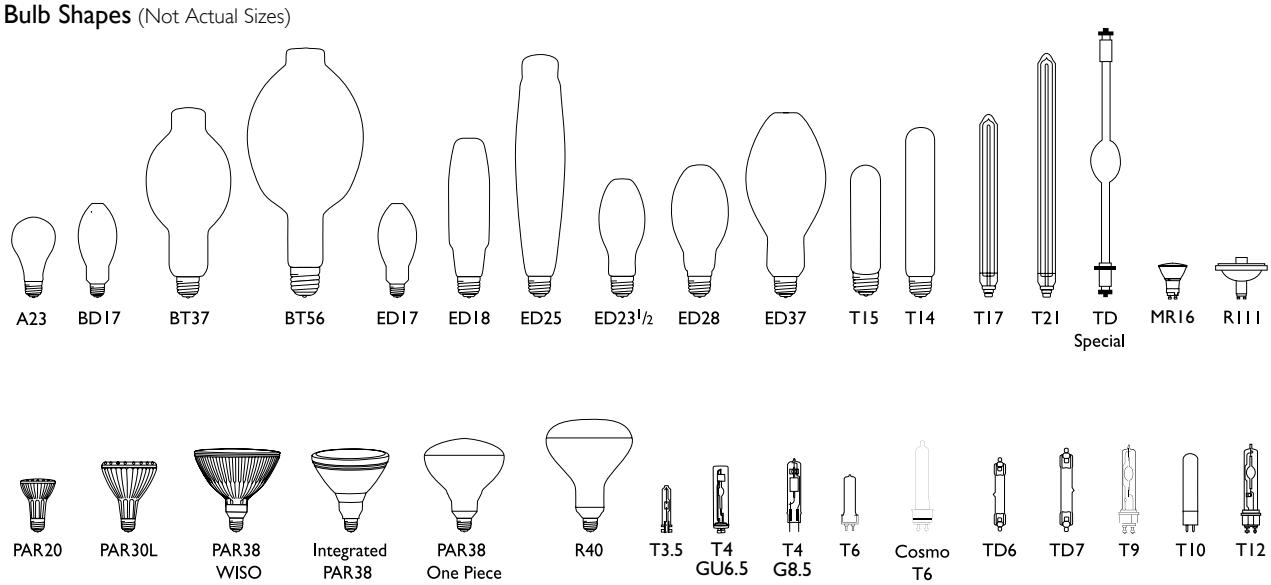
For the most current product information, go to the e-catalog on **www.philips.com**
HID symbols and footnotes located on page 82



Base Types (Not Actual Sizes)



Bulb Shapes (Not Actual Sizes)



High Intensity Discharge Lamps

Symbols and Footnotes

For the most current product information, go to the e-catalog on www.philips.com

□ Exclusive to Philips Lighting Company

■ Nickel plated brass base

▲ Aluminum base

★ Heat resisting glass bulb

▯ Maximum Beam Candlepower

▯ Can be used in open luminaire, only if operated vertically ± 15°

● This lamp is better for the environment because of its reduced mercury content. All Philips ALTO lamps give you end-of-life options which can simplify and reduce your lamp disposal costs depending on your state and local regulations

✖ Orders will be shipped until inventory is depleted; no longer manufactured

ⓔ This Bulb Meets US Federal Minimum Efficiency Standard

† New since last printing

◇ Designed for instant start operation.

‡ Quantity shown is minimum shipping container—refer to Net Price Schedule for number of lamps to qualify as a standard case

G = General Lighting

S = Street Lighting

▼ PAR38 (one piece)

⌘ Satisfies the 2005 NEC for use in open luminaries.The 2005 NEC states that luminaires that use a metal halide lamp shall be provided with either a containment barrier that encloses the lamp (historically referred to as an enclosed luminaire) or shall be provided with a means, typically a special lampholder, that will only accept ANSI Type-O metal halide lamp. (Exception—this requirement will not apply to open luminaires with thick-glass parabolic reflector PAR lamps.) For more information regarding use of Type-O, S, and E metal halide systems, please refer to the NEMA white paper on this subject that is freely available at www.nema.org

✱ Operate only on thermally electronic protected ballasts

(351) Rated average life is the life obtained, on average, from large representative groups of lamps in laboratory tests under controlled conditions at 10 or more operating hours per start. It is based on survival of at least 50% of the lamps, and allows for individual lamps or groups of lamps to vary considerably from the average. For HPS lamps, life is based on survival of 67% of the lamps

(352) Measured at 100 hrs. life. Approximate lumen values listed are for vertical operation of the lamp.

(353) Approximate lumen output at 40% of lamp rated average life.

(355) Separate filter is required for black light application.

(359) Electrically insulated support for bulb may be required, especially in horizontal and nearly horizontal operating positions.

(360) Follow fixture manufacturer' recommendations regarding proximity of ballast to bulb.

(362) This lamp should be shielded from moisture to prevent breakage.

(370) C150S55 and C150S56 lamps are not electrically interchangeable. Different ballasts are required for the proper operation of each lamp type. ANSI type S55 ballast is for the 55-volt (normal) lamp and the ANSI type S56 ballast is for the 100 volt (nominal) lamp.

(372) Color characteristics may vary somewhat from one lamp type to another. Time should be allowed for the lamp to stabilize in color when it is turned on for the first time or if for any reason its operating position is changed. This may require several hours' operation, with more than one start. Lamp color and output may change temporarily if the lamp is subjected to excess vibration or shock. Lamp color characteristics may change after long accumulate operating time.

(373) Fixtures should be designed so that sockets and wiring withstand starting pulse up to 5000 volts for 1000 watts and WHITE SON types and 4000 volts for other sizes.

(374) Performance may not be satisfactory unless operated within specified operating positions.

(375) If specified operating position is base up or base down to horizontal, this permits 15° beyond the horizontal.

(376) For use in fixtures which do not redirect a substantial portion of the energy toward the arc tube; otherwise very early failure is anticipated.

(377) Requires a ballast specified or approved for Philips metal halide lamps, or one that is designed to operate all popular brands of metal halide lamps. 1000W types will operate from H36 conventional lag type ballast for Mercury Vapor lamps at ambient temperatures of 50°F or higher. 1000W types must not be operated at 1500W.

(378) Requires auxiliary 10KV pulse ignitor for instant restrike.

(379) It is a characteristic of phosphor-coated vapor lamps to require a few hundred hours of operation to gradually reach normal characteristic color. New lamps may have a slight pink appearance during this initial operating period.

(385) Rated average life: vertical ±15°. Other positions 75% of vertical life.

(387) This lamp can cause serious skin burns and eye inflammation from shortwave ultraviolet radiation and must be fully enclosed in a fixture with an appropriate UV filter. To protect against possible risk of property damage or personal injury due to an arc tube rupture, the fixture enclosure must be capable of withstanding particles of glass having temperatures up to 1000°C. **DO NOT USE THIS LAMP IF THE UV FILTER IS MISSING.**

(389) Operates at rated output on ANSI 430W S145 SON AGRO ballasts.

(391) Requires a ballast specified or approved for Philips Metal Halide lamp or one designed to the indicated ANSI Standard. A pulse ignitor is required. Sockets and wiring must withstand starting pulse.

(392) Supply volts must be ±5% of rated ballast line volts for reactor type and ±10% for CWA or electronic ballasts.

(393) Vertical lumens. Horizontal lumens 6%–10% lower.

(394) To maintain color consistency within 250K, group relamp at 7500 hours.

(396) UV filtered design (FadeBlock).

(397) Operate only on thermally protected ballasts.

(399) This product utilizes ALTO Lamp Technology. ALTO products pass the US EPA's Toxicity Characteristic Leaching Procedure (TCLP) for non-hazardous waste status.

(400) Energy-saver retrofit for 175W, M107 ballast.

(401) MasterColor Metal Halide Lamps are not recommended for use on dimmers and are not warranted if used on dimmer systems.

(402) Primarily used for sports-lighting applications. Life, initial and mean lumens are for horizontal operation. In vertical position and at 10 or more hours per start, lamp life is extended to 6000 hours, initial lumens are 170,000 and mean lumens are 136,000.

(405) 97% Lumen maintenance at 10% of rated average life. 93% lumen maintenance at 40% of rated average life.

(406) CAUTION: Beware of inadvertent circuit overload in new construction. Because of power factor of 0.57 in the ballast of the lamp, the lamp uses 0.36 amps.

(407) Operating Position is Universal, unless otherwise indicated. See Warnings, Cautions and Operating Instructions for further information.

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for MasterColor Integrated PAR 38 Lamps

Warnings, Cautions and Operating Instructions

"WARNING: These lamps can cause serious skin burn and eye inflammation from short wave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA:21CFR 1040.30 Canada:SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous short wave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the envelope is struck.

WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000°C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication. If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen, **THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

This lamp contains an arc tube with a filling gas containing less than 41 nCi of Kr-85 and is distributed by Philips Lighting Company, a division of Philips Electronics North America Corporation, Somerset, New Jersey, 08873.

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING **LAMP OPERATING INSTRUCTIONS** MUST BE FOLLOWED.

LAMP OPERATING INSTRUCTIONS:

1. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
2. At high lighting levels or when illuminating light-sensitive materials the use of an extra UV filter is recommended.
3. Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards.
4. Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock, and color appearance may vary between individual lamps.
5. Lamps may require up to 10 minutes to re-light if there is a power interruption.
6. Do not operate with an additional ballast, since a ballast is integrated in the lamp itself.
7. **Do not use in totally enclosed recessed fixtures.**
8. Take care in handling and disposing of lamps. If an arc tube is broken, avoid skin contact with any of the contents or fragments.
9. Lamp should not be used with dimmers.
10. Protect lamp, lamp socket and wiring against moisture, corrosive atmosphere and excessive heat. Lamp should be used in dry locations only.

These lamps may be used in open fixtures.

Hg—LAMP CONTAINS MERCURY
Manage in Accord with Disposal Laws
See: www.lamprecycle.org or 1-800-555-0050

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for MasterColor (Elite) Ceramic Metal Halide Lamps: Single Ended CDM-T G12, CDM-T Warm G12, CDM-T Fresh G12, CDM-TC G8.5, CDM-Tm GU6.5 and CDM-Tm PGJ5 (Universal); Double-Ended CDM-TD RX7 (Horizontal ± 45°, Enclosed Fixtures Only)

Warnings, Cautions and Operating Instructions

"WARNING: These lamps can cause serious skin burn and eye inflammation from short wave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA:21CFR 1040.30 Canada:SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous short wave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the envelope is struck.

WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000° C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen, **THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

Certain lamps that will retain all the glass particles should inner arc-tube rupture occur are commercially available from Philips Lighting Company.

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING **LAMP OPERATING INSTRUCTIONS** MUST BE FOLLOWED.

LAMP OPERATING INSTRUCTIONS:

1. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
2. Use only in fully enclosed fixtures capable of withstanding particles of glass having temperatures up to 1000°C. Lens/diffuser material must be heat resistant. Consult fixture manufacturer regarding the suitability of the fixture for this lamp.
3. Do not operate a fixture with a missing or broken lens/diffuser. At high lighting levels or when illuminating light-sensitive materials the use of an extra UV filter is recommended.
4. Operate lamp only within specified limits of operating position.
5. Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards. When inserting a new CDM-Tm lamp, twist the lamp 45° clock-wise in the holder to ensure proper electrical and mechanical connection.
6. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.

A. Operate lamp only within specified limits of operation.

B. For total supply load refer to ballast manufacturers electrical data.

C. Operate CDM-T (G12 base) lamps only on thermally protected ballasts.

D. Operate CDM-TC lamps (G8.5 base) and CDM-Tm (PGJ5 and GU6.5 base) only on thermally protected electronic ballasts.

E. Operate CDM-T (G12 base) 39W/842, CDM-T Fresh (G12 Base), CDM-T Warm (G12 Base) and CDM-T (G12 base) Elite only on thermally protected electronic ballasts.

7. Periodically inspect the outer envelope. Replace any lamps that show scratches, cracks or damage.
8. If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass.
9. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
10. Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock and color appearance may vary between individual lamps.
11. Lamps may require 4–8 minutes (10–15 minutes for CDM-Tm) to re-light if there is a power interruption.
12. Take care in handling and disposing of lamps. If an arc tube is broken, avoid skin contact with any of the contents or fragments.

High Intensity Discharge Lamps

Warnings, Cautions and Operating Instructions

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for MasterColor CDM Elite Medium Watt Ceramic Metal Halide Tubular Single-Ended T9 and T12 Lamps

Warnings, Cautions and Operating Instructions

R**"WARNING:** These lamps can cause serious skin burn and eye inflammation from short wave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA: 21CFR 1040.30 Canada:SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous short wave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the envelope is struck.

WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000° C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication. If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen, **THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE. Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING **LAMP OPERATING INSTRUCTIONS** MUST BE FOLLOWED.

LAMP OPERATING INSTRUCTIONS:

1. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
2. If the lamp is marked on the base with /E, use only in enclosed fixture capable of withstanding particles of glass having temperatures up to 1000°C. If the lamp is marked on the base with /O, lamp should retain all the glass particles should inner arc tube rupture occur.
3. Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards.
4. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer:
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturers electrical data.
   C. All Pulse Start lamps require a socket rated to withstand a 4,000 volt pulse.
5. Periodically inspect the outer envelope. **Replace any lamps that show scratches, cracks or damage.**
6. If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass.
7. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
8. Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock, and color appearance may vary between individual lamps.
9. Lamps may require 10 minutes to re-light if there is a power interruption.
10. Take care in handling and disposing of lamps. If an arc tube is broken, avoid skin contact with any of the contents or fragments.
11. Use this lamp only in fixtures that contain a Pulse Start metal halide ballast and are specifically designed for use with Pulse Start metal halide lamps.
12. If a lamp is shipped individually by itself, please pack the lamp with sufficient cushioning materials to prevent damage to the internal structure of the lamp. Failure to pack an individual lamp properly could lead to short life and early failure.

Until the lamp has achieved at least 10 hours of operation, the lamp should never be turned OFF sooner than 2 minutes, including during installation test. In case that this has happened, you have to wait 1 hour before switching on again. Failure to comply with this requirement may lead to ignition problems.

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for Energy Advantage Ceramic Metal Halide lamps with AllStart Technology, ED17 Lamps (Enclosed Fixtures); Energy Advantage CMH lamps with AllStart Technology (Open or Enclosed Fixtures); Energy Advantage CDM Long Life Lamp with AllStart Technology (Open or Enclosed Fixtures)

Warnings, Cautions and Operating Instructions

R**"WARNING:** These lamps can cause serious skin burn and eye inflammation from short wave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA:21CFR 1040.30 Canada:SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous short wave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the envelope is struck.

WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000°C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication. If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen, **THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

These lamps are designed to retain all the glass particles should an arc tube rupture occur. The following operating instructions are recommended to minimize these occurrences.

This lamp contains an arc tube with a filling gas containing less than 65 nCi Kr-85 and is distributed by Philips Lighting Company, a division of Philips Electronics North America Corporation, Somerset, New Jersey, 08873.

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING **LAMP OPERATING INSTRUCTIONS** MUST BE FOLLOWED.

LAMP OPERATING INSTRUCTIONS:

1. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
2. Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards.
3. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturers electrical data.
   C. These lamps can be used in both Probe Start and Pulse Start Magnetic ballast. Reference the technical data sheet for proper ANSI ballast code compatibility. Do not operate lamps on electronic ballasts.
   D. All Pulse Start mogul based lamps require a socket rated to withstand a 4000 volt pulse.
4. Periodically inspect the outer envelope. Replace any lamps that show scratches, cracks or damage
5. If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass.
6. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
7. Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock, and color appearance may vary between individual lamps.
8. Lamps may require 10 to 15 minutes to re-light if there is a power interruption. Less than 10 minutes on pulse start ballasts.
9. Take care in handling and disposing of lamps. If an arc tube is broken, avoid skin contact with any of the contents or fragments.

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for Protected MasterColor Ceramic Metal Halide PAR, MasterColor Ceramic Metal Halide MR16 Elite, and CDM-R111 Lamps (Open or Enclosed Fixtures)

Warnings, Cautions and Operating Instructions

R**"WARNING:** These lamps can cause serious skin burn and eye inflammation from short wave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA:21CFR 1040.30 Canada: SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous short wave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the envelope is struck.

WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000° C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication. If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen, **THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE. These lamps are designed to retain all the glass particles should an arc tube rupture occur. The following operating instructions are recommended to minimize these occurrences.**

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING **LAMP OPERATING INSTRUCTIONS** MUST BE FOLLOWED.

LAMP OPERATING INSTRUCTIONS:

1. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
2. Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards.
3. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturers electrical data.
   C. Operate PAR20 3000K and PAR30L 3000K lamps only on thermally protected ballast.
   D. Operate 20W PAR20 3000K and 20W PAR30L 3000K lamps only on thermally protected electronic ballast.
   E. Operate PAR20 4000K and PAR30L 4000K lamps only on thermally protected electronic ballast.
   F. Operate CDM-R111 lamps only on thermally protected electronic ballast.
   G. Operate CDM PAR30L Elite and CDM MR16 Elite lamps only on thermally protected electronic ballast.
4. Periodically inspect the outer envelope. Replace any lamps that show scratches, cracks or damage.
5. If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass.
6. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
7. Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock, and color appearance may vary between individual lamps.
8. Lamps may require up to 10 minutes (4–8 minutes for CDM-R111) to re-light if there is a power interruption.
9. Take care in handling and disposing of lamps. If an arc tube is broken, avoid skin contact with any of the contents or fragments.
10. For proper installation and removal, lamp should be handled by the sides of the reflector and not by the aluminum front anti-glare cap.

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for MasterColor Ceramic Metal Halide Lamps ED17 and ED28 (Enclosed Fixtures); Protected MasterColor Ceramic Metal Halide Lamps ED17P (Open or Enclosed Fixtures)

Warnings, Cautions and Operating Instructions

R**"WARNING:** These lamps can cause serious skin burn and eye inflammation from short wave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA:21CFR 1040.30 Canada:SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous short wave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the envelope is struck.

WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000° C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication. If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen,
THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.

Use ED17 and ED28 lamps in enclosed luminaires ONLY that are capable of withstanding particles of glass having temperatures up to 1000°C. ED17P types are designed to retain all the glass particles should an arc tube rupture occur.

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING **LAMP OPERATING INSTRUCTIONS** MUST BE FOLLOWED.

LAMP OPERATING INSTRUCTIONS:

1. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
2. Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards.
3. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturers electrical data.
4. Periodically inspect the outer envelope. Replace any lamps that show scratches, cracks or damage.
5. If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass.
6. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
7. Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock and color appearance may vary between individual lamps.
8. Lamps may require 4 to 8 minutes to re-light if there is a power interruption.
9. Take care in handling and disposing of lamps. If an arc tube is broken, avoid skin contact with any of the contents or fragments.

High Intensity Discharge Lamps

Warnings, Cautions and Operating Instructions

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for Philips MasterColor Ceramic Metal Halide Pulse Start ED 23½ Lamps featuring ALTO Lamp Technology (For Enclosed Fixtures Only)

Warnings, Cautions and Operating Instructions

R**"WARNING:** These lamps can cause serious skin burn and eye inflammation from short wave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA:21CFR 1040.30 Canada:SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous short wave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb could cause glass to fly if the envelope is struck.

WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000° C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication. If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen, **THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

This lamp contains an arc tube with a filling gas containing not less than 25nCi of Kr-85 and is distributed by Philips Lighting Company, a division of Philips Electronics North America Corporation, Somerset, New Jersey, 08873.

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING **LAMP OPERATING INSTRUCTIONS** MUST BE FOLLOWED.

LAMP OPERATING INSTRUCTIONS:

1. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
2. Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards.
3. **Use only in an enclosed fixture capable of withstanding particles of glass having temperatures up to 1000°C.**
4. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturers electrical data.
   C. All Pulse Start lamps require a socket rated to withstand a 4000 Volt pulse.
5. Periodically inspect the outer envelope. Replace any lamps that show scratches, cracks or damage.
6. If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass.
7. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
8. Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock, and color appearance may vary between individual lamps.
9. Lamps may require 10 to 15 minutes to re-light if there is a power interruption.
10. Take care in handling and disposing of lamps. If an arc tube is broken, avoid skin contact with any of the contents or fragments.
11. Use this lamp only in a fixture that contains a Pulse Start metal halide ballast and is specifically designed for use with Pulse Start metal halide lamps.

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS CosmoWhite Lamp (For Enclosed Fixtures Only)

Warnings, Cautions and Operating Instructions

R**"WARNING:** These lamps can cause serious skin burn and eye inflammation from short wave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA:21CFR 1040.30 Canada:SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous short wave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb could cause glass to fly if the envelope is struck.

WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000°C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication. If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen, **THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING **LAMP OPERATING INSTRUCTIONS** MUST BE FOLLOWED.

LAMP OPERATING INSTRUCTIONS:

1. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
2. Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards.
3. **Use only in an enclosed fixture capable of withstanding particles of glass having temperatures up to 1000°C.**
4. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturer's electrical data.
   C. All CosmoWhite lamps require a PGZ12 socket rated to withstand a 5000 Volt pulse.
5. Periodically inspect the outer envelope. Replace any broken lamps and lamps that show scratches, cracks or damage immediately.
6. If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass.
7. Protect lamp, lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
8. Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock, and color appearance may vary between individual lamps.
9. Lamps may require 10 to 15 minutes to re-light if there is a power interruption.
10. Take care in handling and disposing of lamps. Don't break the outer bulb of an end of life lamp. If an arc tube is broken, avoid skin contact with any of the contents or fragments.
11. Use this lamp only in a fixture that contains an Advance CosmoWhite electronic low frequency square wave ballast.
12. When inserting a new lamp, hold it by the quartz bulb, not by the metal lamp base; twist the lamp 45° clockwise in the lamp holder to ensure proper electrical and mechanical connection.
13. Store the lamps in cool and dry conditions to prevent the oxidation of the exterior metal parts.
14. Consult your Philips Lighting or Advance representative if you have any questions.

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for Pulse Start Metal Halide Lamps (Base Up Operation ±15° Unless Otherwise Noted; Enclosed Fixtures Only)

Warnings, Cautions and Operating Instructions

R**"WARNING:** These lamps can cause serious skin burn and eye inflammation from shortwave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA:21CFR 1040.30 Canada: SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous shortwave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the envelope is struck.

WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000° C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication. If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen, **THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

Certain lamps that will retain all the glass particles should inner arc-tube rupture occur are commercially available from Philips Lighting Company.

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING **LAMP OPERATING INSTRUCTIONS** MUST BE FOLLOWED.

LAMP OPERATING INSTRUCTIONS:

1. Turn off lamps at least once a week for at least 15 minutes in systems which are operating on a continuous basis (24 hours/day-7days/week). FAILURE TO TURN OFF LAMPS FOR THE MINIMUM RECOMMENDED TIME MAY INCREASE THE POSSIBILITY OF AN INNER ARC-TUBE RUPTURE.
2. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
3. **Use only in an enclosed fixture capable of withstanding particles of glass having temperatures up to 1000°C, unless otherwise noted.**
4. Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards.
5. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturers electrical data.
   C. All Pulse Start mogul based lamps require a socket rated to withstand a 4000 volt pulse.
6. Periodically inspect the outer envelope. Replace any lamps that show scratches, cracks or damage.
7. If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass.
8. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
9. Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock and color appearance may vary between individual lamps.
10. Lamps may require 2 to 4 minutes to relight if there is a power interruption.
11. Take care in handling and disposing of lamps. If an arc tube is broken, avoid skin contact with any of the contents or fragments.
12. Use this lamp only in fixtures that contain a Pulse Start metal halide ballast and are specifically designed for use with Pulse Start metal halide lamps.

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for Protected Pulse Start Metal Halide Lamps (Base Up Operation ±15° Unless Noted; Open or Enclosed Fixtures)

Warnings, Cautions and Operating Instructions

R**"WARNING:** These lamps can cause serious skin burn and eye inflammation from shortwave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA:21CFR 1040.30 Canada:SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous shortwave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the envelope is struck.

WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000° C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication. If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen, **THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

These lamps are designed to retain all the glass particles should an arc tube rupture occur. The following operating instructions are recommended to minimize these occurrences.

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING **LAMP OPERATING INSTRUCTIONS** MUST BE FOLLOWED.

LAMP OPERATING INSTRUCTIONS:

1. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
2. Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards.
3. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturers electrical data.
   C. All Pulse Start mogul based lamps require a socket rated to withstand a 4000 volt pulse.
4. Periodically inspect the outer envelope. Replace any lamps that show scratches, cracks or damage.
5. If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass.
6. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
7. Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock and color appearance may vary between individual lamps.
8. Lamps may require 2 to 4 minutes to re-light if there is a power interruption.
9. Take care in handling and disposing of lamps. If an arc tube is broken, avoid skin contact with any of the contents or fragments.
10. Use this lamp only in fixtures that contain a Pulse Start metal halide ballast and are specifically designed for use with Pulse Start metal halide lamps.

High Intensity Discharge Lamps

Warnings, Cautions and Operating Instructions

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for Protected Metal Halide Lamps (Base Up Operation ± 15° Unless Noted; Open or Enclosed Fixtures)

Warnings, Cautions and Operating Instructions

R**"WARNING:** These lamps can cause serious skin burn and eye inflammation from short wave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA: 21CFR 1040.30 Canada: SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous short wave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the envelope is struck.

WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000°C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication. If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen, **THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

These lamps are designed to retain all the glass particles should an arc tube rupture occur.

The following operating instructions are recommended to minimize these occurrences.

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING **LAMP OPERATING INSTRUCTIONS** MUST BE FOLLOWED.

LAMP OPERATING INSTRUCTIONS:

1. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
2. Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards.
3. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturers electrical data.
4. Periodically inspect the outer envelope. Replace any lamps that show scratches, cracks or damage.
5. If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass.
6. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
7. Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock and color appearance may vary between individual lamps.
8. Lamps may require 10 to 20 minutes to re-light if there is a power interruption.
9. Take care in handling and disposing of lamps. If an arc tube is broken, avoid skin contact with any of the contents or fragments.
10. Do not use this lamp:
    A. In a fixture that contains a Pulse Start metal halide ballast.
    B. In a fixture that is specifically designed for use with Pulse Start metal halide lamps. **Operation of these lamps on Pulse Start Metal Halide systems may increase the chance of an outer bulb rupture and pieces of extremely hot glass might be discharged into the surrounding environment.**

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for Standard Metal Halide Lamps (Enclosed Fixtures Only)

Warnings, Cautions and Operating Instructions

R**"WARNING:** These lamps can cause serious skin burn and eye inflammation from short wave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA: 21CFR 1040.30 Canada:SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous short wave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the envelope is struck.

WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000° C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication. If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen, **THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

Certain lamps that will retain all the glass particles should inner arc-tube rupture occur are commercially available from Philips Lighting Company.

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING **LAMP OPERATING INSTRUCTIONS** MUST BE FOLLOWED.

LAMP OPERATING INSTRUCTIONS:

1. Turn off lamps at least once a week for at least 15 minutes in systems which are operating on a continuous basis (24 hours/day-7days/week). FAILURE TO TURN OFF LAMPS FOR THE MINIMUM RECOMMENDED TIME MAY INCREASE THE POSSIBILITY OF AN INNER ARC-TUBE RUPTURE.
2. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
3. **Use only in an enclosed fixture capable of withstanding particles of glass having temperatures up to 1000°C.**
4. Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards.
5. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturers electrical data.
6. Periodically inspect the outer envelope. Replace any lamps that show scratches, cracks or damage.
7. If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass.
8. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
9. Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock and color appearance may vary between individual lamps.
10. Lamps may require 10 to 20 minutes to re-light if there is a power interruption.
11. Take care in handling and disposing of lamps. If an arc tube is broken, avoid skin contact with any of the contents or fragments.
12. Do not use this lamp:
    A. In a fixture that contains a Pulse Start metal halide ballast.
    B. In a fixture that is specifically designed for use with Pulse Start metal halide lamps. **Operation of these lamps on Pulse Start Metal Halide systems may increase the chance of an outer bulb rupture and pieces of extremely hot glass might be discharged into the surrounding environment.**

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for Mini White SON and WhiteSON High Pressure Sodium Lamps

Warnings, Cautions and Operating Instructions

"WARNING: These lamps must be operated in fixtures designed for use with High Pressure Sodium lamps. The fixture wattage rating must match the wattage indicated on the outer glass bulb. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the glass is struck.

CAUTION: Operating the lamp improperly may result in **PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

1. If the outer glass bulb is broken, shut off power immediately and remove the lamp after it has cooled.
2. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturers electrical data.
   C. Operate Mini WhiteSON lamps only on approved electronic ballasts.
3. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
4. Replace the lamp if the outer glass bulb has been scratched, cracked or damaged in any way.
5. If a lamp bulb support is used, be sure to insulate the support electrically so as to avoid possible decomposition of the bulb glass.
6. Do not use this lamp in a fixture which redirects a substantial portion of the energy toward the arc tube and its immediate vicinity, as this may lead to very early lamp failure.
7. Take care in handling and disposing of lamps. If arc tube is broken, avoid skin contact with any of the contents or fragments.
8. The arc tube of this lamp contains sodium and mercury. Dispose of in accordance with federal, state and local requirements.
9. It is possible that the light color will suddenly change. After some time the lamp will regain its old color.
10. In order to prevent damage to the ballast, the lamp should be replaced as quickly as possible at the end of its lifetime (lamp color turns yellow, lamp flickers and fails to start).
11. For Mini WhiteSON lamps, after 10,000 hours of burning the light color will become yellow. The lamp must then be replaced.
12. For WhiteSON lamps, after 10,000 hours of burning the light color will become yellow. The lamp must then be replaced.

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for Ceramalux High Pressure Sodium Lamps

Warnings, Cautions and Operating Instructions

WARNING: These lamps must be operated in fixtures designed for use with High Pressure Sodium lamps. The fixture wattage rating must match the wattage indicated on the outer glass bulb. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the glass is struck.

CAUTION: Operating the lamp improperly may result in **PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

1. If the outer glass bulb is broken, shut off power immediately and remove the lamp after it has cooled.
2. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturers electrical data.
3. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
4. Replace the lamp if the outer glass bulb has been scratched, cracked or damaged in any way.
5. If a lamp bulb support is used, be sure to insulate the support electrically so as to avoid possible decomposition of the bulb glass.
6. Do not use this lamp in a fixture which redirects a substantial portion of the energy toward the arc tube and its immediate vicinity, as this may lead to very early lamp failure.
7. Take care in handling and disposing of lamps. If arc tube is broken, avoid skin contact with any of the contents or fragments.
8. The arc tube of this lamp contains sodium and mercury. Dispose of in accordance with federal, state and local requirements.

High Intensity Discharge Lamps

Warnings, Cautions and Operating Instructions

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for Low Pressure Sodium Lamps—SOX

Warnings, Cautions and Operating Instructions

WARNING: These lamps must be operated in fixtures designed for use with Low Pressure Sodium lamps. The fixture wattage rating must match the wattage indicated on the outer glass bulb. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter.

CAUTION: Operating the lamp improperly and not following operating instructions may result in **PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE.**

1. If the outer glass bulb is broken, shut off power immediately and remove the lamp after it has cooled.
2. Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer.
   A. Operate lamp only within specified limits of operation.
   B. For total supply load refer to ballast manufacturers electrical data.
3. Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
4. Replace the lamp if the outer glass bulb has been scratched, cracked or damaged in any way.
5. Take care in handling and disposing of lamps. If arc tube is broken, avoid skin contact with any of the contents or fragments.
6. The arc tube of this lamp contains sodium. Sodium can generate a high degree of heat when exposed to water. Dispose of in accordance with federal, state and local requirements.

WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS for Mercury Vapor Lamps

Warnings, Cautions and Operating Instructions

R**"WARNING:** This lamp can cause serious skin burn and eye inflammation from shortwave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available." This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA:21CFR 1040.30 Canada:SOR/DORS/80-381)

WARNING: The following **GOOD LAMP PRACTICES** are recommended to reduce the possibility of an arc tube rupture and the associated risk of property damage or personal injury.

GOOD LAMP PRACTICES:

1. TURN LAMPS OFF AT LEAST ONCE PER WEEK FOR AT LEAST 15 MINUTES, in systems which are otherwise operating on a continuous basis (24 hours/day-7 days/week).
2. **RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE.** Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
3. OPERATE LAMP WITH PROPER CIRCUITS AND AUXILIARY EQUIPMENT.

CAUTION: Electric discharge lamp—use only with proper circuits and auxiliary equipment designed to produce established electrical values for this lamp. Operating the lamp improperly may result in damage to equipment or personal injury, for which the lamp manufacturer does not assume any responsibility.

If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass. Do not scratch the bulb or subject it to pressure, as it could fail violently. If the outer bulb is broken, turn off the lamp and replace it promptly.

Do not use this lamp in a fixture which redirects a substantial portion of the energy toward the arc tube and its immediate vicinity, as this may lead to very early lamp failure.

NOTICE: For total supply load, add auxiliary (ballast) watts to lamp watts.

High Intensity Discharge Lamps

Cross Reference Guide

Philips		OSI		GE	
Ordering Code	**ANSI Code**	**Order Code**	**ANSI**	**Description**	**ANSI**
CDM20/TM/830/GU6.5 ELITE	C156/E	MC20TF/U/GU6.5/830	C156/E	CMH20T/U830GU6.5	C156/M156/E
CDM35/TM/930/GU6.5 ELITE	C130/E	MC39TF/U/GU6.5/830	C130/E	CMH39ULR930GU6.5	C130/M130/E
CDM50/TM/930/GU6.5 ELITE	C193/E				
CDM20/TM/830	C175/E				
CDM35/TM/930	C179/E				
CDM Elite 20/TC/830	C156/E	MC20TC/U/G8.5/830PB	C156/E	CMH20TCU830/G8.5	C156/M156/E
CDM Elite 35/TC/930	C130/E			CMH39/930G8.5ULR	C130/M130/E
CDM Elite35/TC/842	C130/E				
CDM Elite 50/TC/930	C193/E				
CDM Elite 70/TC/930	C139/E			CMH70U930G8.5ULR	C139/M139/E
CDM Elite70/TC/942	C139/E				
CDM35/TC/830	C130/E	MC39TC/U/G8.5/830PB	C130/E	CMH39TCU830/G8.5	C130/M130/E
CDM35/TC/842	C130/E			CMH39TCU942/G8.5	C130/M130/E
CDM70/TC/830	C139/E	MC70TC/U/G8.5/930PB	C139/E	CMH70TCU830G8.5	C139/M139/E
CDM/70/TC/942	C139/E			CMH70TCU942/G8.5	C139/M139/E
CDM Elite 20/T6/830	C156/E				
CDM Elite 35/T6/930	C130/E	MC39T6/U/G12/930	C130/E	CMH39U930G12ULR	C130/M130/E
CDM Elite35/T6/842	C130/E				
CDM Elite 50/T6/930	C193/E				
CDM Elite50/T6/942	C193/E				
CDM Elite 70/T6/930	C139/E	MC70T6/U/G12/930PB	C139/E	CMH70U930G12ULR	C139/M139/E
CDM Elite70/T6/942	C139/E				
CDM Elite 100/T6/930	C191/E	MC100T6/U/G12/830	C191/E		
CDM35/T6/830	C130/E	MC39T6/U/G12/830PB	C130/E	CMH39TUVCU830G12	C130/M130/E
CDM35/T6/842	C130/E	MC39T6/U/G12/940PB	C130/E	CMH39T/U/942/G12	C130/M130/E
CDM70/T6/830	C139/E	MC70T6/U/G12/830PB	C139/E	CMH70TU/830/G12	C139/M139/E
CDM70/T6/942	C139/E	MC70T6/U/G12/940PB	C139/E	CMH70TU/942/G12	C139/M139/E
CDM150/T6/830	C142/E	MC150T7.5/U/G12/830	C142/E	CMH150TU/830/G12	C142/M102/E
CDM150/T6/942	C142/E	MC150T7.5/U/G12/940PB	C142/E	CMH150TU/942/G12	C142/M102/E
CDM70/TD/830	C139/C85/E	MC70T6/DE/830PB	C139/E	CMH70/TD/830RX7S	M85/M139/E
CDM150/TD/830	C142/C102/C81E	MC150T7.5/DE/830PB	C102/E	CMH150TD830RX7S	M81/M142/E
CDM EliteMW/210/T9/930/U/E	C183/E				
CDM EliteMW/210/T9/942/U/E	C183/E				
CDM EliteMW/315/T9/930/U/E	C182/E				
CDM EliteMW/315/T9/942/U/E	C182/E				
CDM EliteMW 210/T12/930/U/O	C183/O				
CDM EliteMW 210/T12/942/U/O	C183/O				
CDM EliteMW 315/T12/930/U/O	C182/O				
CDM EliteMW 315/T12/942/U/O	C182/O				
CPO-T WHITE 45W/728					
CPO-T WHITE 60W/728	C187/E				
CPO-T WHITE 90W/728	C188/E				
CPO-T WHITE 140W/728	C189/E				
CPO-T WHITE 60W/840	C187/E				
CPO-T WHITE 90W/840	C188/E				
CPO-T WHITE 140W/840	C189/E				
CDM-i25W/830/PAR38/10/ALTO		MCP24EL/PAR38/U/830/SP10/ECO		CMHi23P38SP/ECO	
CDM-i25W/830/PAR38/25/ALTO		MCP24EL/PAR38/U/830/NFL25/ECO		CMHi23P38FL/ECO	
CDM-i25W/830/PAR38/40/ALTO		MCP24EL/PAR38/U/830/FL40/ECO		CMHi23P38WFL/ECO	
CDM-R111/20W/830 10DG	C175/O				
CDM-R111/35W/830 10DG	C130/O				
CDM-R111/35W/830 24DG	C130/O				
CDM-R111/35W/830 40DG	C130/O				
CDM-R111/70W/830 10DG	C139/O				
CDM-R111/70W/830 24DG	C139/O				
CDM-R111/70W/830 40DG	C139/O				

High Intensity Discharge Lamps

Cross Reference Guide

Philips		OSI		GE	
Ordering Code	**ANSI Code**	**Order Code**	**ANSI**	**Description**	
CDM-MR16/20W/830/10D ELITE	C156/O			CMH20MR16/830/SP	C156/M156/O
CDM-MR16/20W/830/25D ELITE	C156/O			CMH20MR16/830/FL	C156/M156/O
CDM-MR16/20W/830/40D ELITE	C156/O			CMH20MR16/830WFL	C156/M156/O
CDM-MR16/35W/930/10D ELITE	C130/O			CMH39MR16UL93/SP	C130/M130/O
CDM-MR16/35W/930/25D ELITE	C130/O			CMH39MR16UL93/FL	C130/M130/O
CDM-MR16/35W/930/40D ELITE	C130/O			CMH39MR16UL93/WFL	C130/M130/O
CDM-MR16/35W/930/10D ELITE	C130/O			CMH39MR16/930/SP	C130/M130/O
CDM-MR16/35W/930/25D ELITE	C130/O			CMH39MR16/930/FL	C130/M130/O
CDM-MR16/35W/930/40D ELITE	C130/O			CMH39MR16/930WFL	C130/M130/O
CDM-MR16/50W/930/25D ELITE	C193/O				
CDM-MR16/50W/930/40D ELITE	C193/O				
CDM20/PAR20/M/SP/3K/ALTO	C156/C175/O	MCP20PAR20/U/830/SP10/ECO PB	M156/O	CMH20PAR20/SP	C156/M156/O
CDM20/PAR20/M/FL/3K/ALTO	C156/C175/O	MCP20PAR20/U/830/FL/ECO PB	M156/O	CMH20PAR20/FL	C156/M156/O
CDM20/PAR30L/M/SP/3K/ALTO	C156/C175/O	MCP20PAR30LN/U/830/SP/ECOPB	M156/O	CMH20PAR30/SP10	C156/M156/O
CDM20/PAR30L/M/FL/3K/ALTO	C156/C175/O	MCP20PAR30LN/U/830/FL/ECOPB	M156/O	CMH20PAR30/FL25	C156/M156/O
CDM35/PAR20/M/SP/3K/ALTO	C130/O	MCP39PAR20/U/830/SPPB	M130/O	CMH39UPAR20SP10	C130/M130/O
CDM35/PAR20/M/FL/3K/ALTO	C130/O	MCP39PAR20/U/830/FLPB	M130/O	CMH39UPAR20FL25	C130/M130/O
CDM35/PAR20/M/SP/4K/ALTO	C130/O	MCP39PAR20/U/940/SP	M130/O	CMH39PAR20/NSP4K	C130/M130/O
CDM35/PAR20/M/FL/4K/ALTO	C130/O	MCP39PAR20/U/940/FL	M130/O	CMH39PAR20/FL4K	C130/M130/O
CDM35/PAR30L/M/SP/3K/ALTO	C130/O	MCP39PAR30LN/U/830/SP/ECOPB	M130/O	CMH39/PAR30LSP10	C130/M130/O
CDM35/PAR30L/M/FL/3K/ALTO	C130/O	MCP39PAR30LN/U/830/FL/ECOPB	M130/O	CMH39PAR30L/FL25	C130/M130/O
CDM70/PAR30L/M/SP/3K/ALTO	M143/M98/O	MCP70PAR30LN/U/930/SP/ECOPB	M139/O	CMH70PAR30L830SP	C139/M98/O
CDM70/PAR30L/M/FL/3K/ALTO	M143/M98/O	MCP70PAR30LN/U/930/FL/ECOPB	M139/O	CMH70PAR30L830FL	C139/M98/O
CDM70/PAR30L/M/SP/4K/ALTO	C139/O	MCP70PAR30LN/U/940/SP/ECO	M139/O		
CDM70/PAR30L/M/FL/4K/ALTO	C139/O	MCP70PAR30LN/U/940/FL/ECO	M139/O		
CDM70/PAR38/SP/3K/ALTO	M143/M98/O	MCP70PAR38/U/830/SP/ECOPB	M139/O	CMH70PAR38SP/ECO	C98/M139/M143/O
CDM70/PAR38/FL/3K/ALTO	M143/M98/O	MCP70PAR38/U/830/FL/ECOPB	M139/O	CMH70PAR38FL/ECO	C98/M139/M143/O
CDM70/PAR38/SP/4K/ALTO	M143/M98/O				
CDM70/PAR38/FL/4K/ALTO	M143/M98/O				
CDM100/PAR38/SP/3K/ALTO	M140/M90/O	MCP100PAR38/U/830/SP/ECOPB	M90/O	CMH100PAR38SPECO	C90/M90/M140/O
CDM100/PAR38/FL/3K/ALTO	M140/M90/O	MCP100PAR38/U/830/FL/ECOPB	M90/O	CMH100PAR38FLECO	C90/M90/M140/O
CDM100/PAR38/SP/4K/ALTO	M140/M90/O				
CDM100/PAR38/FL/4K/ALTO	M140/M90/O				
MHC50/U/MP/3K ELITE	M148/M110/O	MCP50/U/MED/830PB	C110/O		
MHC50/U/MP/4K/ALTO	M148/M110/O				
MHC70/U/MP/3K ELITE	M143/M98/O	MCP70/U/MED/830PB	C98/O	CMH70U830MED/O	M143/M98/C98/O
MHC70/C/U/MP/3K ELITE	M143/M98/O	MCP70/C/U/MED/830PB	C98/O	CMH70CU830MED/O	M143/M98/C98/O
MHC70/U/MP/4K/ALTO	M143/M98/O	MCP70/U/MED/940PB	C98/O	CMH70U942MED/O	M143/M98/C98/O
MHC70/C/U/MP/4K/ALTO	M143/M98/O	MCP70/C/U/MED/940PB	C98/O	CMH70CU942MED/O	M143/M98/C98/O
MHC100/U/MP/3K ELITE	M140/M90/O	MCP100/U/MED/830PB	C90/O		
MHC100/C/U/MP/3K ELITE	M140/M90/O	MCP100/C/U/MED/830PB	C90/O		
MHC100/U/MP/4K/ALTO	M140/M90/O	MCP100/U/MED/940PB	C90/O		
MHC100/C/U/MP/4K/ALTO	M140/M90/O	MCP100/C/U/MED/940PB	C90/O		
MHC150/U/MP/3K/ALTO	M142/M102/O	MCP150/U/MED/830PB	C102/O	CMH150U830MED/O	C102/M142/O
MHC150/C/U/MP/3K/ALTO	M142/M102/O	MCP150/C/U/MED/830PB	C102/O	CMH150CU830MED/O	C102/M142/O
MHC150/U/MP/4K/ALTO	M142/M102/O			CMH150U942MED/O	C102/M142/O
MHC150/C/U/MP/4K/ALTO	M142/M102/O			CMH150CU942MED/O	C102/M142/O
MHC50/U/M/3K ELITE	C148/C110/E				
MHC50/C/U/M/3K ELITE	C148/C110/E				
MHC50/U/M/4K/ALTO	M148/M110/E				
MHC50/C/U/M/4K/ALTO	M148/M110/E				
MHC70/U/M/3K ELITE	C143/C98/E	MC70/U/MED/830	C98/E	CMH70/U/830/MED	M139/M98/C98/E
MHC70/C/U/M/3K ELITE	C143/C98/E	MC70/C/U/MED/830	C98/E	CMH70/C/U/830MED	M139/M98/C98/E
MHC70/U/M/4K/ALTO	M143/M98/E	MC70/U/MED/940	C98/E		
MHC70/C/U/M/4K/ALTO	M143/M98/E	MC70/C/U/MED/940	C98/E		
MHC100/U/M/3K ELITE	C140/C90/E	MC100/U/MED/830	C90/E	CMH100/U/830/MED	C90/M90/M140/E

High Intensity Discharge Lamps

Cross Reference Guide

Philips		OSI		GE	
Ordering Code	**ANSI Code**	**Order Code**	**ANSI**	**Description**	
MHC100/C/U/M/3K ELITE	C140/C90/E	MC100/C/U/MED/830	C90/E	CMH100/C/U830MED	C90/M90/M140/E
MHC100/U/M/4K/ALTO	M140/M90/E	MC100/U/MED/940	C90/E		
MHC100/C/U/M/4K/ALTO	M140/M90/E	MC100/C/U/MED/940	C90/E		
MHC100/U/ED28/HR/4K	M140/M90/E				
MHC150/U/M/3K/ALTO	M142/M102/E	MC150/U/MED/830	C102/E		
MHC150/C/U/3K/ALTO	M142/M102/E	MC150/C/U/MED/830	C102/E		
MHC150/U/M/4K/ALTO	M142/M102/E	MC150/U/MED/940	C102/E		
MHC150/C/U/M/4K/ALTO	M142/M102/E	MC150/C/U/MED/940	C102/E		
CDM70/U/PS/4K ALTO	M143/M98/E				
CDM100/U/PS/4K ALTO	M140/M90/E	MC100/U/ET23.5/942	C90/E		
CDM150/U/PS/4K ALTO	M142/M102/E	MC150/U/ET23.5/942	C102/E		
CDM145/U/M/4K/ED17 EA AllStart	C192/E				
CDM145/C/U/M/4K/ED17 EA AllStart	C192/E				
CDM145/U/O/4K/ED28 EA AllStart	C192/O				
CDM145/C/U/O/4K/ED28 EA AllStart	C192/O				
CDM205/U/O/4K EA AllStart	C184/O				
CDM205/C/U/O/4K EA AllStart	C184/O				
CDM260/U/O/4K EA AllStart	C195/O				
CDM260/C/U/O/4K EA AllStart	C195/O				
CDM330/U/O/4K/ED28 EA AllStart	C185/O				
CDM330/U/O/4K EA AllStart	C185/O				
CDM330/C/U/O/4K EA AllStart	C185/O				
CDM860/V/O/4K/EA BT37	C194/O				
CDM860/V/O/4K/EA BT56	C194/O				
CDM330/V/O/4K EA AllStart XL	C185/O				
MP175/BU/PS	M152/M137/O			MPR175/VBU/PA/O	M137/O
MP250/BU/PS	M153/M138/O	MP250/PS/BU-ONLY	M153/O	MPR250/VBU/PA/O	M138/O
MP320/BU/PS	M154/M132/O			MPR320/VBU/XHOPA	M132/M154/O
MP320/C/BU/PS	M154/M132/O			MPR320C/VBUXHOPA	M132/M154/O
MP350/BU/PS	M131/O	MP350/400/PS/BU-ONLY	M131/O	MPR350/VBU/PA	M131/O
MP400/BU/PS	M155/M128/M135/O	MP350/400/PS/BU-ONLY	M155/O	MPR400/VBU/XHOPA	M135/M155/O
MP400/C/BU/PS	M155/M128/M135/O	MP350/400/C/PS/BU-ONLY	M155/O	MPR400C/VBUXHOPA	M135/M155/O
MP750/BU/PS	M149/O				
MH70/U/M/PS	M98/E	M70/U/MED	M98/E	MVR70/U/MED	M98/E
MH100/U/M/PS	M90/E	M100/U/MED	M90/E	MVR100/U/MED	M90/E
MH150/U/M/PS	M102/E	M150/U/MED	M102/E	MVR150/U/MED	M102/E
MS175/M/BU/PS	M152/M137/E	MS175/PS/BU-ONLY/MED	M152/E	MVR175/VBU/MEDPA	M137/M152/E
MS175/BU/PS	M152/M137/E	MS175/PS/BU-ONLY	M152/E	MVR175/VBU/PA	M137/M152/E
MS175/HOR/PS	M152/M137/E				
MS200/BU/PS	M136/E	MS200/PS/BU-ONLY/BT28	M136/E		
MS250/U/PS	M153/M138/E	M250/PS/U	M153/E	MVR250/U/PA	M138/M153/E
MS250/BU/PS	M153/M138/E	MS250/PS/BU-ONLY	M153/E	MVR250/VBU/PA	M138/M153/E
MS320/U/PS	M154/M132/E	MS320/PS/BU-HOR	M154/E	MVR320/VBU/HO/PA	M132/M154/E
MS350/BU/PS	M131/E			MVR350VBUXHOPA/E	M131/E
MS400/BU/ED28/PS	M155/M128/M135/E	MS400/PS/BU-ONLY/BT28	M155/E	MVR400/VBUED28PA	M135/M155/E
MS400/HOR/ED28/PS	M155/M128/M135/E			MVR400/HOR/ED28/PA	M135/M155/E
MS400/U/PS	M155/M135/M128/E			MVR400/HOR/PA	M135/M155/E
MS750/BU/BT37/PS	M149/E	MS750/PS/BU-HOR/BT37	M149/E	MVR750/VBU/PA	M149/E
MS750/HOR/BT37/PS	M149/E	MS750/PS/BU-HOR/BT37	M149/E		
MS1000/BU/BT37/PS	M141/E	M1000/PS/U/BT37	M141/E	MVR1000U/BT37/PA	M141/E

High Intensity Discharge Lamps

Cross Reference Guide

Philips		OSI		GE	
Ordering Code	**ANSI Code**	**Order Code**	**ANSI**	**Description**	
MP175/BU	M57/O	MP175/BU-ONLY	M57/O	MPR175/VBU/O	M57/O
MP250/BU	M58/O	MP250/BU-ONLY	M58/O	MPR250/VBU/O	M58/O
MP360BU/EW	M165/M59/O	MSP360/SS/BU-ONLY	M59/O	MPR360VBUWM/HO/O	M59/O
MP360/C/BU/EW	M165/M59/O	MSP360/C/SS/BU-ONLY	M59/O	MPR360CVBUWMHO/O	M59/O
MP400/BU	M59/O	MP400/BU-ONLY	M59/O	MPR400/VBU/HO/O	M59/O
MP400/C/BU	M59/O	MP400/C/BU-ONLY	M59/O	MPR400C/VBU/HO/O	M59/O
MP1000/BU	M47/O	MP1000/BU-ONLY	M47/O	MPR1000/VBU/HO/O	M47/O
MH150/U/M	M107/E				
MH150/C/U/M	M107/E				
MH175/U/M	M57/E	M175/U/MED	M57/E	MVR175/U/MED	M57/E
MH175/C/U/M	M57/E	M175/C/U/MED	M57/E	MVR175/C/U/MED	M57/E
MH175/U	M57/E	M175/U	M57/E	MVR175/U	M57/E
MH175/C/U	M57/E	M175/C/U	M57/E	MVR175/C/U	M57/E
MH250/U	M58/E	M250/U	M58/E	MVR250/U	M58/E
MH250/C/U	M58/E	M250/C/U	M58/E	MVR250/C/U	M58/E
MH400/U/ED28	M59/E	M400/U/BT28	M59/E	MVR400/U/ED28	M59/E
MH400/U	M59/E	M400/U	M59/S	MVR400/U	M59/S
MH400/C/U	M59/E	M400/C/U	M59/S	MVR400/C/U	M59/S
MH1000/U/BT37	M47/E	M1000/U/BT37	M47/E	MVR1000/U/BT37	M47/E
MH1000/U	M47/E	M1000/U	M47/S	MVR1000/U	M47/S
MH1000/C/U	M47/E	M1000/C/U	M47/S	MVR1000/C/U	M47/S
MH1500/U	M48/E			MVR1500/U/SPORTS	M48/E
CDM-T FRESH 70W/740	C139/E				
CDM-T Warm 70W/925	C139/E				
SDW-T 100W/LV	S105				
SDW-TG 100W/T6/825	S167				
C35S76/M	S76	LU35/MED	S76	LU35/MED/ECO	S76/O
C50S68/M	S68	LU50/MED	S68	LU50/MED/ECO	S68/O
C50S68/ALTO	S68	LU50/ECO	S68	LU50/H/ECO	S68/O
C70S62/M	S62	LU70/MED	S62	LU70/MED/ECO	S62/O
C70S62/D/M	S62	LU70/D/MED	S62	LU70/D/MED/ECO	S62/O
C70S62/ALTO	S62	LU70/ECO	S62	LU70/H/ECO	S62/O
C100S54/M	S54S	LU100/MED	S54	LU100/MED/ECO	S54/O
C100S54/D/M	S54S	LU100/D/MED	S54	LU100/D/MED/ECO	S54/O
C100S54/ALTO	S54	LU100/ECO	S54	LU100/H/ECO	S54/O
C100S54/D/ALTO	S54	LU100/D	S54	LU100/D/H/ECO	S54/O
C150S55/M	S55	LU150/55/MED	S55	LU150/MED/ECO	S55/O
C150S55/D/M	S55	LU150/55/D/MED	S55	LU150/D/MED/ECO	S55/O
C150S55/ALTO	S55	LU150/55/ECO	S55	LU150/55/H/ECO	S55/O
C150S56/ALTO	S56	LU150/100	S56	LU150/100(ED28)	S56/O
C200S66/ALTO	S66MN-200	LU200/ECO	S66	LU200/H/ECO	S66/O
C250S50/ALTO	S50	LU250/ECO	S50	LU250/H/ECO	S50/O
C400S51/ALTO	S51	LU400/ECO	S51	LU400/H/ECO	S51/O
C600S106	S106	LU600 SUPER	S106	LU600/T	S106/O
C1000S52/ALTO	S52XB-1000	LU1000/ECO	S52	LU1000/ECO	S52/O
C1000S52/ED37	S52				
C70S62/ALTO NC HPS	S62	LU70/PLUS/ECO	S62	LU70/ECO/NC	S62/O
C100S54/ALTO NC HPS	S54	LU100/PLUS/ECO	S54	LU100/ECO/NC	S54/O
C150S55/ALTO NC HPS	S55	LU150/55/PLUS/ECO	S55	LU150/55/ECO/NC	S55/O
C200S66/ALTO NC HPS	S66	LU200/PLUS/ECO	S66	LU200/ECO/NC	S66/O
C250S50/ALTO NC HPS	S50	LU250/PLUS/ECO	S50	LU250/ECO/NC	S50/O
C400S51/ALTO NC HPS	S51	LU400/PLUS/ECO	S51	LU400/ECO/NC	S51/O
C1000S52/ALTO NC HPS	S52	LU1000/PLUS	S52		

High Intensity Discharge Lamps

Cross Reference Guide

Philips		OSI		GE	
Ordering Code	**ANSI Code**	**Order Code**	**ANSI**	**Description**	
C50S68/2	S68				
C70S62/2	S62	LU70/SBY	S62	LU70/SBY/XL	S62/O
C100S54/2	S54	LU100/SBY	S54	LU100/SBY/XL	S54/O
C150S55/2	S55	LU150/55/SBY	S55	LU150/55/SBY/XL	S55/O
C250S50/2	S50	LU250/SBY	S50	LU250/SBY/XL	S50/O
C400S51/2	S51	LU400/SBY	S51	LU400/SBY/XL	S51/O
C1000S52/2	S52	LU1000/SBY	S52	LU1000/SBY/XL	S52/O
SON AGRO 430W	S145/S51				
SON-T PIA Grn Pw/400W	S51	400W PLANTASTAR	S51	LU400/XOPSL/T/40	
SON-T PIA Grn Pw/600W/230V	S106	600W PLANTASTAR	S106	LU600/XOPSL/T/40	
SON-T PIA Grn Pw/600W/347V	S106				
SON-T PIA Grn Pw/600W/480V	S106				
C1000S52/AGROLITE XT	S52	LU1000/PLANTASTAR	S52		
GreenPower CDM-TP 315/T12/930/U/O	C182/O				
SOX-E18	L69	SOX18	L69		
SOX35	L70	SOX35	L70		
SOX55	L71	SOX55	L71		
SOX90	L72	SOX90	L72		
SOX135	L73	SOX135	L73		
SOX180	L74	SOX180	L74RF		
H38JA-100/DX	H38	H38JA-100/DX	H38	HR100DX38	
H38MP-100/DX	H38				
H39KB-175	H39	H39KB-175	H39	HR175A39	
H39KC-175/DX	H39	H39KC-175/DX	H39	HR175DX39	
H37KC-250/DX	H37	H37KC-250/DX	H37	HR250DX37	
H33GL-400/DX	H33	H33GL-400/DX	H33	HR400DX33	

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Double-Ended Linear Lamps

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Philips Halogen Lamps are designed to provide visual appeal, highlight merchandise and save on energy costs.

Put people and merchandise in the best light

The Philips Halogen lamp family is perfect for retail lighting. Halogen lamps provide bright, white light and help save on energy and maintenance costs.

Halogen Energy Advantage IR Plus Lamps provide the most enhanced features of our halogen lamp line. The double-ended burner with an IR coating optimizes lumen output. Therefore, you can use a lower wattage lamp to achieve energy savings and also get a longer rated average life than standard halogen equivalents.

Halogená Energy Advantage Lamps provide increased energy saving when compared to standard incandescent lamps and last longer.

EcoVantage Lamps are an elegant, energy saving alternative to ordinary household incandescent light. EcoVantage lamps are fully dimmable and meet the requirement of EISA 2007* legislation.

* Complies with the Energy Independence and Security Act of 2007 (Public Law 110-140). Section 321—Efficient Light Bulbs.

Current Product	Philips Upgrade Product	Benefit	Page
60W PAR38 Halogen	Energy Advantage Halogen PAR38 IR Plus 39W	• High quality light brings out colors and textures • High performance IR coating on a double-ended quartz burner • Increased uniform beam intensity without hot spots	102
75W R20 Incandescent	Halogená Energy Advantage R20 40W	• Save 35W and 47% energy saving† • Complies with EISA 2007 (Energy Independence and Security Act of 2007) efficiency standards for 2012–2014	100
60W A19 Incandescent	EcoVantage Natural Light 43W	• Provides light similar to natural daylight • Saves 28% in energy costs when replacing a 60W incandescent◊ • Complies with EISA 2007 (Energy Independence and Security Act of 2007) efficiency standards for 2012–2014	98

† 75W - 40W = 35W / 75W = 47%. When compared to a 75-Watt standard incandescent A19 rated at 570 lumens, the 40-Watt EcoVantage A19 rated at 570 lumens provides 47% energy savings.

◊ 60W - 43W = 17W / 60W = 28%. When compared to a 60-Watt standard incandescent A19 rated at 680 lumens, the 43-Watt EcoVantage A19 rated at 630 lumens provides 28% energy savings.

Halogen Lamps

EcoVantage Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
EcoVantage A-Shape (97, 103)															FTC REQUIREMENTS¥	
29	A19	Med.	40983-9		29A19/EV	120	12	White	C, CC-8	4⅞	1000	—	400	0.9	$3.49	2810
			42600-7	†	29A19/EV	120	24	White	C, CC-8	4⅞	1000	—	400	0.9	$3.49	2810
			41050-6		29A19/EV/CL	120	12	Clear	C, CC-8	4⅞	1000	—	400	0.9	$3.49	2790
43	A19	Med.	40984-7		43A19/EV	120	12	White	C, CC-8	4⅞	1000	—	750	0.9	$5.18	2920
			42603-1	†	43A19/EV	120	24	White	C, CC-8	4⅞	1000	—	750	0.9	$5.18	2920
			41049-8		43A19/EV/CL	120	12	Clear	C, CC-8	4⅞	1000	—	750	0.9	$5.18	2920
			22695-1		43A19/EV/NTL	120	12	Natural Light	C, CC-8	4⅞	1100	—	600	1.0	$5.18	2930
53	A19	Med.	22696-9		53A19/EV/NTL	120	12	Natural Light	C, CC-8	4⅞	1100	—	790	1.0	$6.38	2960
72	A19	Med.	40982-1		72A19/EV	120	12	White	C, CC-8	4⅞	1000	—	1490	0.9	$8.67	3000
			42604-9	†	72A19/EV	120	24	White	C, CC-8	4⅞	1000	—	1490	0.9	$8.67	3000
			42924-1		72A19/EV/CL	120	12	Clear	C, CC-8	4⅞	1000	—	1490	0.9	$8.67	2990
			22699-3		72A19/EV/NTL	120	12	Natural Light	C, CC-8	4⅞	1100	—	1170	1.0	$8.67	3070
EcoVantage Decorative Blister-Carded																
25	B11	Cand.	42411-9	(97)*†	25B11/E12/EV/CL	120	12	Clear, Blister Card	C, CC-8	3⅜	2750	—	280	2.5	$3.01	2900
		Med.	42427-5	(97)*†	25B11/E26/EV/CL	120	12	Clear, Blister Card	C, CC-8	3⅛	2200	—	280	2.0	$3.01	2900
	BA11	Cand.	42409-3	(97)*†	25BA11/E12/EV/CL	120	12	Clear, Blister Card	C, CC-8	4	2750	—	280	2.0	$3.01	2900
		Med.	42425-9	(97)*†	25BA11/E26/EV/CL	120	12	Clear, Blister Card	C, CC-8	3⅞	2200	—	280	2.0	$3.01	2900
	G16½	Cand.	42086-9	(97)*†	BC25G16½C/EV/CL	120	12	Clear, Blister Card	C, CC-8	2⅜	2200		270	2.0	$3.01	2700
			42087-7	(97)*†	BC25G16½C/EV/W	120	12	White, Blister Card	C, CC-8	2⅜	2200		270	2.0	$3.01	2700
40	B11	Cand.	42412-7	(97)*†	40B11/E12/EV/CL	120	12	Clear, Blister Card	C, CC-8	3⅜	2750	—	540	2.5	$4.82	2900
		Med.	42428-3	(97)*†	40B11/E26/EV/CL	120	12	Clear, Blister Card	C, CC-8	3⅛	2200	—	540	2.0	$4.82	2900
	BA11	Cand.	42410-1	(97)*†	40BA11/E12/EV/CL	120	12	Clear, Blister Card	C, CC-8	4	2750	—	540	2.5	$4.82	2900
		Med.	42426-7	(97)*†	40BA11/E26/EV/CL	120	12	Clear, Blister Card	C, CC-8	3⅞	2200	—	540	2.0	$4.82	2900
72	F15	Med.	42385-5	(88,103)†	BC72F15/EV/CL	120	4	Clear, Blister Card	C, CC-8	4⅞	1000	—	1490	0.9	$8.67	3000

For the most current product information, go to the e-catalog on **www.philips.com**

Halogen symbols and footnotes located on page 109


A19 White Med.


A19 Clear Med.


A19 Natural Light Med.


B11 Cand.


B11 Med.


BA11 Cand.


BA11 Med.


BA11 Med.


G16.5 Cand.


F15 Med.

Halogen Lamps

EcoVantage Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
													FTC REQUIREMENTS¥			
EcoVantage Decorative Boxed (97)																
40	G25	Med.	42084-4	†	40G25/EV/CL	120	12	Clear	C, CC-8	4⅞	2200	—	550	2.0	$4.82	2800
			42085-1	†	40G25/EV/W	120	12	White	C, CC-8	4⅞	2200	—	500	2.0	$4.82	2800
EcoVantage Halogen Pro PAR20 Lamps (82, 86)																
39	PAR20	Med.	42512-4	†	39PAR20/EVP/SP10	120	15	Spot 10°	C,CC-8	3⅜	1100	3840	500	1.0	$4.70	2900
			42520-7	†	39PAR20/EVP/FL25	120	15	Flood 25°	C,CC-8	3⅜	1100	865	500	1.0	$4.70	2900
EcoVantage Halogen Pro PAR30S Lamps (82, 86)																
39	PAR30S	Med.	42891-2	†	39PAR30S/EVP/SP10	120	15	Spot 10°	C, CC-8	3⅜	1100	6300	530	1.0	$4.70	2900
			42896-0	†	39PAR30S/EVP/FL25	120	15	Flood 25°	C, CC-8	3⅜	1100	1870	530	1.0	$4.70	2900
53	PAR30S	Med.	42888-8	©† (104)	53PAR30S/EVP/SP10	120	15	Spot 10°	C, CC-8	3⅜	1100	10,000	920	1.0	$6.38	2860
			42890-4	©† (104)	53PAR30S/EVP/FL25	120	15	Flood 25°	C, CC-8	3⅜	1100	3100	920	1.0	$6.38	2860
			42898-6	©† (104)	53PAR30S/EVP/WFL40	120	15	Wide Flood 40°	C, CC-8	3⅜	1100	1400	920	1.0	$6.38	2860
EcoVantage Halogen Pro PAR30L Lamps (82, 86)																
39	PAR30L	Med.	42887-0	†	39PAR30L/EVP/FL25	120	15	Flood 25°	C, CC-8	4½	1100	1870	520	1.0	$4.70	2900
53	PAR30L	Med.	42892-0	©† (104)	53PAR30L/EVP/FL25	120	15	Flood 25°	C, CC-8	4½	1100	3100	920	1.0	$6.38	2860
			42895-2	©† (104)	53PAR30L/EVP/WFL40	120	15	Wide Flood 40°	C, CC-8	4½	1100	1400	920	1.0	$6.38	2860
EcoVantage Halogen Pro PAR38 Lamps (82, 86)																
39	PAR38	Med.Skt.	42886-2	†	39PAR38/EVP/SP10	120	12	Spot 10°	C, CC-8	5⅛	1100	7000	570	1.0	$4.70	2900
			42884-7	†	39PAR38/EVP/FL25	120	12	Flood 25°	C, CC-8	5⅛	1100	1900	570	1.0	$4.70	2900
53	PAR38	Med.Skt.	42889-6	©† (104)	53PAR38/EVP/SP10	120	12	Spot 10°	C, CC-8	5⅛	1100	11,000	920	1.0	$6.38	2860
			42885-4	©† (104)	53PAR38/EVP/FL25	120	12	Flood 25°	C, CC-8	5⅛	1100	3250	920	1.0	$6.38	2860
72	PAR38	Med.Skt.	42894-6	©† (104)	72PAR38/EVP/SP10	120	12	Spot 10°	C, CC-8	5⅛	1100	16,000	1350	1.0	$8.67	2880
			42893-8	©† (104)	72PAR38/EVP/FL25	120	12	Flood 25°	C, CC-8	5⅛	1100	4500	1350	1.0	$8.67	2880

For the most current product information, go to the e-catalog on **www.philips.com**

Halogen symbols and footnotes located on page 109



Halogen Lamps

Halogená and Halogen PAR Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
													FTC REQUIREMENTS¥			
Halogená Decorative Blister-Carded (96)																
25	F10½	Cand.	14450-1		BC25F10½C/HAL/CL	120	12	Clear, Blister Card	C, CC-8	4⅜	3000	—	300	2.7	$3.01	2900
		Med.	14453-5		BC25F10½/HAL/CL TP	120	12	Clear, Blister Card	C, CC-8	4⅜	3000	—	300	2.7	$3.01	2900
40	F10½	Cand.	14451-9		BC40F10½C/HAL/CL	120	12	Clear, Blister Card	C, CC-8	4⅜	3000	—	540	2.7	$4.82	2900
		Med.	14454-3		BC40F10½/HAL/CL TP	120	12	Clear, Blister Card	C, CC-8	4⅜	3000	—	540	2.7	$4.82	2900
60	F15	Med.	38551-8		BC60F15/HAL/POST TOP	120	4	Clear, Blister Card	C, CC-8	4 13⁄16	3000	—	1000	2.7	$7.23	2900
Halogená Energy Advantage Pro Packs (97, 102)																
40	R20	Med.	22236-4	Ⓔ	40R20/HEA/FL	120	12	Flood	C, CC-8	3 15⁄16	3000	—	550	2.7	$4.82	2700
	BR30	Med.	21359-5	Ⓔ	40BR30/HEA/FL	120	12	Flood	C, CC-8	5⅜	3000	—	570	2.7	$4.82	2700
	BR40	Med.	22238-0	Ⓔ	40BR40/HEA/FL	120	12	Flood	C, CC-8	6½	3000	—	590	2.7	$4.82	2730
70	BR40	Med.	22997-1	(104) Ⓔ	70BR40/HEA/FL	120	12	Flood	C, CC-8	6½	3000	—	1320	2.7	$8.43	2810
Halogen PAR16 Lamps (82, 86)																
45	PAR16	Med.	26335-0		45PAR16/HAL/SP10	120	15	Spot 10°	C, CC-8	3½	3000	3850	420	2.7	$5.42	2900
			26345-9		45PAR16/HAL/FL27	120	15	Flood 27°	C, CC-8	3½	3000	1275	420	2.7	$5.42	2800
60	PAR16	Med.	33004-3		60PAR16/HAL/SP10	120	15	Spot 10°	C, CC-8	3½	3000	5075	580	2.7	$7.23	2900
			33006-8		60PAR16/HAL/FL27	120	15	Flood 27°	C, CC-8	3½	3000	1900	580	2.7	$7.23	2900
Halogen PAR16 Lamps 130V (82, 86)																
45	PAR16	Med.	26348-3		45PAR16/HAL/FL27	130	15	Flood 27°	C, CC-8	3½	2500	1275	450	4.6	$5.42	2900
								Ratings @ 120V=40W			5000	1040	340			
60	PAR16	Med.	33007-6		60PAR16/HAL/FL27	130	15	Flood 27°	C, CC-8	3½	3000	1900	580	5.5	$7.23	2900
								Ratings @ 120V=53W			6000	1440	450			

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Halogen symbols and footnotes located on page 109



Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
													FTC REQUIREMENTS¥			
PAR20 Electronic Lamps (82, 86)																
20	PAR20	Med.	40494-7	▢	20PAR20E/SP10	120	12	Spot 10°	C, C-8	3⅜	5000	6600	220	4.6	$2.41	2900
		Med.	15216-5	▢	20PAR20E/FL25	120	12	Flood 25°	C, C-8	3⅜	5000	1200	220	4.6	$2.41	2900
Energy Advantage IR Plus (IRC+) Halogen PAR30 Long Neck Lamps (82, 86)																
50	PAR30L	Med.	23799-0	© (104)	50PAR30L/IRC+/SP10	120	15	Spot 10°	C, CC-8	4⅞	4400	12,000	900	4.0	$6.02	2750
			23429-4	© (104)	50PAR30L/IRC+/FL25	120	15	Flood 25°	C, CC-8	4⅞	4400	3500	900	4.0	$6.02	2750
			23800-6	© (104)	50PAR30L/IRC+/WFL40	120	15	Wide Flood 40°	C, CC-8	4⅞	4400	1600	900	4.0	$6.02	2750
Energy Advantage IR Plus (IRC+) Halogen PAR30 Short Neck Lamps (82, 86)																
39	PAR30S	Med.	23853-5		39PAR30S/IRC+/SP10	120	15	Spot 10°	C, CC-8	3⅝	4400	11,000	650	4.0	$4.70	2800
			23854-3		39PAR30S/IRC+/FL25	120	15	Flood 25°	C, CC-8	3⅝	4400	2200	650	4.0	$4.70	2800
50	PAR30S	Med.	14499-7	© † (104)	50PAR30S/IRC+/SP10	120	15	Spot 10°	C, CC-8	3⅝	4400	12,000	950	4.0	$6.02	2740
			14500-3	© † (104)	50PAR30S/IRC+/FL25	120	15	Flood 25°	C, CC-8	3⅝	4400	3850	950	4.0	$6.02	2740
			14501-1	© † (104)	50PAR30S/IRC+/WFL40	120	15	Wide Flood 40°	C, CC-8	3⅝	4400	1420	950	4.0	$6.02	2740
55	PAR30S	Med.	23855-0	© (104)	55PAR30S/IRC+/SP10	120	15	Spot 10°	C, CC-8	3⅝	4400	13,000	1020	4.0	$6.62	2760
			23856-8	© (104)	55PAR30S/IRC+/FL25	120	15	Flood 25°	C, CC-8	3⅝	4400	3300	1020	4.0	$6.62	2760
			23857-6	© (104)	55PAR30S/IRC+/ WFL40	120	15	Wide Flood 40°	C, CC-8	3⅝	4400	1500	1020	4.0	$6.62	2760
Energy Advantage IR Economy (IRCE) Halogen PAR30 Short Neck Lamps (82, 86)																
40	PAR30S	Med.	23751-1	© † (104)	40PAR30S/IRCE/SP10	120	15	Spot 10°	C, CC-8	3⅝	3000	8100	640	2.7	$4.82	2770
			23729-7	© † (104)	40PAR30S/IRCE/FL25	120	15	Flood 25°	C, CC-8	3⅝	3000	2100	640	2.7	$4.82	2770
50	PAR30S	Med.	23730-5	© † (104)	50PAR30S/IRCE/SP10	120	15	Spot 10°	C, CC-8	3⅝	3000	10,000	850	2.7	$6.02	2710
			23731-3	© † (104)	50PAR30S/IRCE/FL25	120	15	Flood 25°	C, CC-8	3⅝	3000	3000	850	2.7	$6.02	2710

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Halogen Lamps

PAR36 and Energy Advantage Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
Halogen PAR36 Lamps (82, 86)															FTC REQUIREMENTS¥	
11	PAR36	MP	15683-6		11PAR36Q/FL30	12	6	PAR, Flood	C, C-6	2¾	2000	—	60	1.8	$1.32	3000
			41718-8	†	11PAR36Q/FL30	12	12	PAR, Flood	C, C-6	2¾	2000	—	60	1.8	$1.32	3000
25	PAR36	MP	42204-8	†	25PAR36Q/FL30	12	12	PAR, Flood	C, C-6	2¾	2000	—	270	1.8	$3.01	3000
36	PAR36	MP	41525-7	†	36PAR36Q/FL30	12	6	PAR, Flood	C, C-6	2¾	4000	—	450	3.7	$4.34	3000
50	PAR36	MP	22859-3	†	50PAR36/NSP	12	12	PAR, Narrow Spot	C, C-6	2¾	2000	—	650	1.8	$6.02	3000
			41524-0	†	50PAR36Q/FL30	12	6	PAR, Flood	C, C-6	2¾	4000	—	650	3.7	$6.02	3000
			29603-8	†	50PAR36/WFL	12	12	PAR, Wide Flood	C, C-6	2¾	2000	—	650	1.8	$6.02	3000
Energy Advantage IR Plus (IRC+) Halogen PAR38 (82, 86)																
39	PAR38	Med.Skt.	23844-4		39PAR38/IRC+/SP10	120	12	Spot 10°	C, CC-8	5⅝	4400	11,000	680	4.0	$4.70	2800
			23845-1		39PAR38/IRC+/FL25	120	12	Flood 25°	C, CC-8	5⅝	4400	2500	680	4.0	$4.70	2800
50	PAR38	Med.Skt.	14505-2	© (104)	50PAR38/IRC+/SP10	120	12	Spot 10°	C, CC-8	5⅝	4400	15,500	950	4.0	$6.02	2760
	Dioptic Reflector		14506-0	© (104)	50PAR38/IRC+/FL25	120	12	Flood 25°	C, CC-8	5⅝	4400	4000	950	4.0	$6.02	2760
55	PAR38	Med.Skt.	23847-7	© (104)	55PAR38/IRC+/SP10	120	12	Spot 10°	C, CC-8	5⅝	4400	16,500	1100	4.0	$6.62	2700
			23865-9	© (104)	55PAR38/IRC+/FL25	120	12	Flood 25°	C, CC-8	5⅝	4400	4100	1100	4.0	$6.62	2700
			23849-3	© (104)	55PAR38/IRC+/WFL40	120	12	Wide Flood 40°	C, CC-8	5⅝	4400	1800	1100	4.0	$6.62	2700
70	PAR38	Med.Skt.	13861-0	© (104)	70PAR38/IRC+/SP10	120	12	Spot 10°	C, CC-8	5⅝	4400	17,800	1500	4.0	$8.43	2860
			13862-8	© (104)	70PAR38/IRC+/FL25	120	12	Flood 25°	C, CC-8	5⅝	4400	6170	1500	4.0	$8.43	2860
			13863-6	© (104)	70PAR38/IRC+/WFL40	120	12	Wide Flood 40°	C, CC-8	5⅝	4400	2320	1500	4.0	$8.43	2860
83	PAR38	Med.Skt.	23850-1	© (104)	83PAR38/IRC+/SP10	120	12	Spot 10°	C, CC-8	5⅝	4400	25,000	1750	4.0	$10.00	2730
	Dioptic		23851-9	© (104)	83PAR38/IRC+FL25	120	12	Flood 25°	C, CC-8	5⅝	4400	7000	1750	4.0	$10.00	2730
	Reflector		23852-7	© (104)	83PAR38/IRC+/WFL40	120	12	Wide Flood 40°	C, CC-8	5⅝	4400	3000	1750	4.0	$10.00	2730
100	PAR38	Med.Skt.	13876-8	© (104)	100PAR38/IRC+/SP10	120	12	Spot 10°	C, CC-8	5⅝	4400	26,400	2150	4.0	$12.05	2830
	Dioptic		13877-6	© (104)	100PAR38/IRC+/FL25	120	12	Flood 25°	C, CC-8	5⅝	4400	8500	2150	4.0	$12.05	2830
	Reflector		13878-4	© (104)	100PAR38/IRC+/WFL40	120	12	Wide Flood 40°	C, CC-8	5⅝	4400	3500	2150	4.0	$12.05	2830

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PAR36
MP



Energy Advantage IR PAR38
Med. Skt.

Halogen Lamps

Energy Advantage and Mini Reflector Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
													FTC REQUIREMENTS¥			
Energy Advantage IR Economy (IRCE) Halogen PAR38 (82, 86)																
40	PAR38	Med.Skt.	42673-4	© †	40PAR38/IRCE/UT4/SP10	120	12	Spot 10°	C, CC-8	5⅞	3,000	7750	640	2.7	$4.82	2700
			42674-2	© †	40PAR38/IRCE/UT4/FL25	120	12	Flood 25°	C, CC-8	5⅞	3,000	2050	640	2.7	$4.82	2700
			42999-2	© †	40PAR38/IRCE/UT4/WFL40	120	12	Wide Flood 40°	C, CC-8	5⅞	3,000	1000	640	2.7	$4.82	2700
50	PAR38	Med.Skt.	42946-4	© †	50PAR38/IRCE/UT4/SP10	120	12	Spot 10°	C, CC-8	5⅞	3,000	10900	850	2.7	$6.02	2750
			42945-6	© †	50PAR38/IRCE/UT4/FL25	120	12	Flood 25°	C, CC-8	5⅞	3,000	3000	850	2.7	$6.02	2750
			43018-1	© †	50PAR38/IRCE/UT4/WFL40	120	12	Wide Flood 40°	C, CC-8	5⅞	3,000	1500	850	2.7	$6.02	2750
60	PAR38	Med.Skt.	23739-6	© †	60PAR38/IRCE/SP10	120	12	Spot 10°	C, CC-8	5⅞	3000	13,500	1070	2.7	$7.23	2750
			23744-6	© †	60PAR38/IRCE/FL25	120	12	Flood 25°	C, CC-8	5⅞	3000	3800	1070	2.7	$7.23	2850
70	PAR38	Med.Skt.	42944-9	© †	70PAR38/IRCE/UT4/SP10	120	12	Spot 10°	C, CC-8	5⅞	3,000	16000	1300	2.7	$8.43	2800
			43020-7	© †	70PAR38/IRCE/UT4/FL25	120	12	Flood 25°	C, CC-8	5⅞	3,000	4500	1300	2.7	$8.43	2800
			43019-9	© †	70PAR38/IRCE/UT4/WFL40	120	12	Wide Flood 40°	C, CC-8	5⅞	3,000	2300	1300	2.7	$8.43	2800
Halogen MRC11 Blister-Carded (92)																
20	MRC11	GU4	41930-9	†	BC20MRC11/FL30 FTD	12	12	Blister Card, Flood 30°	C, CC-8	1⅝	2000	500	230	1.8	$2.41	2800
Halogen MRC11 (Formerly BrilliantLine Pro) (92)																
20	MRC11	GU4	37822-4		20MRC11/FL30 PRO FTD	12	50	Flood 30°	C, CC-8	1⅝	4000	690	320	3.7	$2.41	3100
Halogen MRC11 Landscape (92)																
10	MRC11	GU4	41722-0	†	10MRC11/FL30/LAND/TP	12	6	Flood 30°	C, CC-8	1⅝	2000	550	230	1.8	$1.20	2750
20	MRC11	GU4	15676-0		20MRC11/FL30/LAND/TP	12	6	Flood 30°	C, CC-8	1⅝	2000	500	230	1.8	$2.41	2800
Halogen MRC16 Display Lamps Blister-Carded (Formerly AccentLine) Dichroic Reflector With Lens (92)																
20	MRC16	GU5.3	41931-7	†	BC20MRC16/FL36 BAB	12	12	Blister Card, Flood 36°	C, C-8	1⅞	3000	550	240	2.7	$2.41	3000
			41568-7	†	BC20MRC16/FL36	12	18	Blister Card, Flood 36°	C, C-8	1⅞	3000	—	200	2.7	$2.41	3000
35	MRC16	GU5.3	41932-5	†	BC35MRC16/FL36 FMW	12	12	Blister Card, Flood 36°	C, C-8	1⅞	3000	1000	540	2.7	$4.22	3000
50	MRC16	GU5.3	41563-8	†	BC50MRC16/SP10 EXT	12	12	Blister Card, Spot 10°	C, C-8	1⅞	3000	8800	790	2.7	$6.02	3000
			41580-2	†	BC50MRC16/SP10	12	18	Blister Card, Spot 10°	C, C-8	1⅞	3000	—	600	2.7	$6.02	2800
			41933-3	†	BC50MRC16/FL36 EXN	12	12	Blister Card, Flood 36°	C, C-8	1⅞	3000	1600	850	2.7	$6.02	3000
			41580-2	†	BC50MRC16/FL	12	18	Blister Card, Flood 36°	C, C-8	1⅞	2000	1200	400	1.8	$6.02	2800
Halogen MRC16 Display Lamps Blister-Carded Reflector With Lens (92)																
20	MRC16	GU5.3	41568-7	†	BC20MRC16/FL36	12	18	Blister Card, Flood 36°	C, C-8	1⅞	3000	—	200	2.7	$2.41	3000

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Energy Advantage IR PAR38 Med. Skt.



MRC11 GU4



MRC16 GU5.3

Halogen Lamps

Mini Reflector Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
Halogen MRC16 Landscape Lamps Blister-Carded (Formerly AccentLine) Dichroic Reflector With Lens (92)													**FTC REQUIREMENTS¥**			
20	MRC16	GU5.3	15677-8		BC20MRC16/FL36/LAND	12	6	Blister Card, Flood 36°	C, C-8	1¾	3000	—	240	2.7	$2.41	3000
35	MRC16	GU5.3	15678-6		BC35MRC16/FL36/LAND	12	6	Blister Card, Flood 36°	C, C-8	1¾	3000	—	400	2.7	$4.22	3000
50	MRC16	GU5.3	15679-4		BC50MRC16/FL36/LAND	12	6	Blister Card, Flood 36°	C, C-8	1¾	3000	—	600	2.7	$6.02	3000
Halogen MR (Formerly AccentLine) (91)																
20	MR16	GU5.3	37802-6		20MR16/SP10 ESX	12	50	Spot 10°	C, C-8	1⅞	3000	3400	240	2.7	$2.41	3100
			37803-4		20MR16/FL36 BAB	12	50	Flood 36°	C, C-8	1⅞	3000	550	240	2.7	$2.41	3100
35	MR16	GU5.3	14056-6		35MR16/FL36	12	50	Flood 36°	C, C-8	1⅞	3000	1000	540	2.7	$4.22	3000
50	MR16	GU5.3	37804-2		50MR16/SP10 EXT	12	50	Spot 10°	C, C-8	1⅞	3000	8800	790	2.7	$6.02	3100
			37807-5		50MR16/NFL24 EXZ	12	50	Narrow Flood 24°	C, C-8	1⅞	3000	2500	800	2.7	$6.02	3100
			37805-9		50MR16/FL36 EXN	12	50	Flood 36°	C, C-8	1⅞	3000	1600	850	2.7	$6.02	3100
Halogen MR Long Life (Formerly BrilliantLine Pro and Continuum Color)																
20	MRC16	GU5.3	37814-1	(92)	20MRC16/SP10 ESX	12	50	Spot 10°	C, C-8	1⅞	6000	5000	310	5.5	$2.41	3100
			37815-8	(92)	20MRC16/FL36 BAB	12	50	Flood 36°	C, C-8	1⅞	6000	780	320	5.5	$2.41	3100
35	MRC16	GU5.3	14054-1	(92)	35MRC16/SP10	12	50	Spot 10°	C, C-8	1⅞	6000	8000	680	5.5	$4.22	3100
			14052-5	(92)	35MRC16/NFL24	12	50	Narrow Flood 24°	C, C-8	1⅞	6000	3100	690	5.5	$4.22	3100
			14053-3	(92)	35MRC16/FL36	12	50	Flood 36°	C, C-8	1⅞	6000	1500	710	5.5	$4.22	3100
50	MRC16	GU5.3	37817-4	(92)	50MRC16/NFL24 EXZ	12	50	Narrow Flood 24°	C, C-8	1⅞	6000	4400	960	5.5	$6.02	3100
			37818-2	(92)	50MRC16/FL36 EXN	12	50	Flood 36°	C, C-8	1⅞	6000	2200	775	5.5	$6.02	3100
75	MR16	GU5.3	37808-3	(91)	75MR16/SP10 EYF	12	50	Spot 10°	C, C-8	1⅞	6000	14,000	1320	5.5	$9.03	3100
			37809-1	(91)	75MR16/FL36 EYC	12	50	Flood 36°	C, C-8	1⅞	6000	2500	1410	5.5	$9.03	3100
Halogen MR Energy Advantage IR (Formerly MasterLine ES IRC) (92)																
20	MRC16	GU5.3	20258-0		20MRC16/IRC/ALU/SP8	12	20	Spot 8°	C, C-8	1⅞	5000	6000	320	4.6	$2.41	3100
			20259-8		20MRC16/IRC/ALU/FL36	12	20	Flood 36°	C, C-8	1⅞	5000	925	325	4.6	$2.41	3100
30	MRC16	GU5.3	20261-4		30MRC16/IRC/ALU/NFL24	12	20	Narrow Flood 24°	C, C-8	1⅞	5000	3000	570	4.6	$3.61	3100
			20262-2		30MRC16/IRC/ALU/FL36	12	20	Flood 36°	C, C-8	1⅞	5000	1500	580	4.6	$3.61	3100
35	MRC16	GU5.3	20263-0		35MRC16/IRC/ALU/SP8	12	20	Spot 8°	C, C-8	1⅞	5000	12,500	720	4.6	$4.22	3100
			21030-2		35MRC16/IRC/NFL24	12	20	Narrow Flood 24°	C, C-8	1⅞	5000	4400	780	4.6	$4.22	3000
			20267-1		35MRC16/IRC/ALU/NFL24	12	20	Narrow Flood 24°	C, C-8	1⅞	5000	4000	730	4.6	$4.22	3100
			20268-9		35MRC16/IRC/ALU/FL36	12	20	Flood 36°	C, C-8	1⅞	5000	2000	740	4.6	$4.22	3000
			20269-7		35MRC16/IRC/ALU/WFL60	12	20	Wide Flood 60°	C, C-8	1⅞	5000	975	750	4.6	$4.22	3100
45	MRC16	GU5.3	20271-3		45MRC16/IRC/SP8	12	20	Spot 8°	C, C-8	1⅞	5000	14,000	1030	4.6	$5.42	3100
			20272-1		45MRC16/IRC/NFL24	12	20	Narrow Flood 24°	C, C-8	1⅞	5000	5400	1040	4.6	$5.42	3100
			20273-9		45MRC16/IRC/FL36	12	20	Flood 36°	C, C-8	1⅞	5000	2600	1050	4.6	$5.42	3100
			20274-7		45MRC16/IRC/WFL60	12	20	Wide Flood 60°	C, C-8	1⅞	5000	1250	1180	4.6	$5.42	3100

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MRC16 GU5.3


MR16 GU5.3

Halogen Lamps

Mini Reflector, ALR, ALUline PRO III, Twistline and Linear Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
													FTC REQUIREMENTS¥			
Halogen MR Aluminum (Formerly Continuum Pro) (92)																
50	MRC16	GU5.3	13982-4		50 MRC16/FL36/A	12	50	Flood 36°	C, C-8	1⅞	5000	2100	950	4.6	$6.02	3100
Closed Aluminum Reflector (ALR) Lamps Aluminum Reflector With Lens (92)																
20	37mm	BA15d	32840-1		20ALR12/NSP6 GBD Clear	12	50	Clear, Narrow Spot 6°	C, C-8	1½	2000	7000	250	1.8	$2.41	3000
			34002-6		20ALR12/SP18 GBE Frost	12	50	Frost, Spot 18°	C, C-8	1½	2000	1500	250	1.8	$2.41	3000
			34003-4		20ALR12/FL32 GBF Frost	12	50	Frost, Flood 32°	C, C-8	1½	2000	750	250	1.8	$2.41	3000
50	56mm	B15d	34091-9		50ALR18/NFL25 GBK Frost	12	50	Frost, Narrow Flood 25°	C, C-8	2¼	2000	2500	820	1.8	$6.02	3000
ALUline PRO III																
50	ALU Pro III	G53	13396-6		ALUIIIMM 50W G53 12V 8D	12	6	Spot 8°	C, C-8	2¾₄	3000	23,000	950	2.7	$6.02	3000
			13397-4		ALUIIIMM 50W G53 12V 24D	12	6	Flood 24°	C, C-8	2¾₄	3000	4000	950	2.7	$6.02	3000
75	ALU Pro III	G53	13398-2		ALUIIIMM 75W G53 12V 8D	12	6	Spot 8°	C, C-8	2¾₄	3000	30,000	1575	2.7	$9.03	3000
Twistline GU10 Blister-Carded (98)																
25	Twistline	GU10	41693-3	†	BC25TWISTLINE GU10/FL25	120	6	Blister Card, Flood 25°	C, C-6	2	2000	345	160	1.8	$3.01	2700
35	Twistline	GU10	41573-7	†	BC35TWISTLINE GU10/FL25	120	6	Blister Card, Flood 25°	C, C-6	2	2000	480	265	1.8	$4.22	2750
			41825-1	†	BC35GU10/HES/FL	120	6	Blister Card, Flood 25°	C, C-6	2	1500	800	410	1.4	$4.22	3000
50	Twistline	GU10	41579-4	†	BC50GU10/HAL/TL	120	6	Blister Card, Flood 25°	C, C-6	2	2000	700	430	1.8	$6.02	2800
			41574-5	†	BC50TWISTLINE GU10/FL25	120	6	Blister Card, Flood 25°	C, C-6	2	2000	700	430	1.8	$6.02	2800
Halogen Single-Ended Linear Lamps Blister-Carded (95)																
50	T4	Mini-Can	41555-4	†	BC50Q/CL	120	12	Blister Card	C, CC-8	2¾	1000	—	500	0.9	$6.02	2700
75	T4	Mini-Can	41556-2	†	BC75Q/CL	120	12	Blister Card	C, CC-8	3	1000	—	1050	0.9	$9.03	2700
			41886-3	†	BC75T4Q/HES/MC	120	12	Blister Card	C, CC-8	2⅜₆	1500	—	1500	1.4	$9.03	3000
100	T4	Mini-Can	41633-9	†	BC100Q/CL ESN	120	12	Blister Card	C, CC-8	2⅜₆	1000	—	1600	0.9	$12.05	2700
150	T4	Mini-Can	41634-7	†	BC150Q/CL ETG	120	12	Blister Card	C, CC-8	3	1000	—	2800	0.9	$18.07	2700

For the most current product information, go to the e-catalog on **www.philips.com**

Halogen symbols and footnotes located on page 109


MRC16 GU5.3


MR16 GU5.3


37mm ALR BA15d


56mm ALR B15d


ALU Pro III G53


Twistline GU10


T4 Mini Can

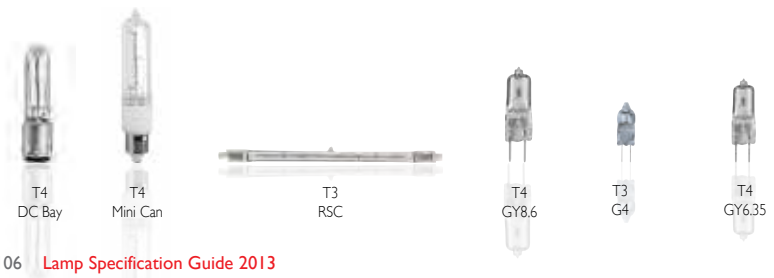
Halogen Lamps

Linear and Capsule Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
															FTC REQUIREMENTS¥	
Halogen Single-Ended Linear Lamps (95)																
100	T4	D.C. Bay	44278-0		100Q/CL/DC ESR	120	12	Clear	C, CC-8	2⅞	1000	—	1600	0.9	$12.05	2700
150	T4	Mini-Can	20049-3		150Q/CL	130	12	Clear	C, CC-8	3	1000	—	2800	0.9	$18.07	2700
250	T4	Mini-Can	14668-8		250Q/CL EHT	120	12	Clear	C, CC-8	3⅛	1000	—	5000	0.9	$30.11	2850
			14667-0		250Q/CL	130	12	Clear	C, CC-8	3⅛	1000	—	5000	0.9	$30.11	2850
Halogen Double-Ended Linear Lamp Blister-Carded (99)																
100	T3	RSC	41560-4	†	BC100T3Q/CL	120	12	Blister Card	C, C-8	3⅛	2000	—	1600	1.8	$12.05	2900
150	T3	RSC	41561-2	†	BC150T3Q/CL	120	12	Blister Card	C, C-8	3⅛	2000	—	2400	1.8	$18.07	2900
			41575-2	†	BC150T3Q/CL LONG	120	12	Blister Card	C, C-8	4⅝	1500	—	2400	1.4	$18.07	2900
			41885-5	†	BC150T3Q/HES/CL	120	6	Blister Card	C, C-8	4⅝	1500	—	2850	1.4	$18.07	3000
300	T3	RSC	20355-4		BC300T3Q/CL	120	12	Blister Card	C, C-8	4⅝	2000	—	5200	1.8	$36.14	2900
			41571-1	†	BC300T3Q/CL/TP	120	12	Blister Card	C, C-8	4⅝	2000	—	5200	1.8	$36.14	2900
500	T3	RSC	41572-9	†	BC500T3Q/CL/TP	120	12	Blister Card	C, C-8	4⅝	2000	—	9500	1.8	$60.23	2900
Halogen Double-Ended Linear Lamp (99)																
300	T3	RSC	39282-9		300T3Q/CL EHM	120	12	Clear	C, C-8	4⅝	2000	—	5200	1.8	$36.14	2900
500	T3	RSC	13223-3		500T3Q/CL	125 130	12	Clear	C, C-8	4⅝	2000	—	9200	1.8	$60.23	2850
			20010-5		500T3Q/CL FCL	120	12	Clear	C, C-8	4⅝	2000	—	9500	1.8	$60.23	2900
1000	T3	RSC	41972-1	†	1000T3Q/CL	240	12	Clear	C, C-8	7⅞	2000	—	21,500	1.8	$120.45	2,950
1500	T3	RSC	41996-9	†	1500T3Q/CL	277	12	Clear	C, C-8	10	2000	—	33,000	1.8	$180.68	2,950
Halogen Mains-Voltage Capsule Lamp Blister-Carded (95)																
35	T4	GY8.6	41632-1	†	BC35W/T4/120V/CAPSULE	120	12	Blister Card	C. CC2V	1 3⁄16	2500	—	400	2.3	$4.22	3000
50	T4	GY8.6	41631-3	†	BC50W/T4/120V/CAPSULE	120	12	Blister Card	C, C-8	2¼	2500	—	600	2.3	$6.02	3000
75	T4	GY8.6	41667-7	†	BC75W/T4/120V/CAPSULE	120	12	Blister Card	C, C-8	2¼	2000	—	1200	1.8	$9.03	3000
			41870-7	†	BC75T4Q/HES/CAP	120	12	Blister Card	C, C-8	2¼	1500	—	1550	1.4	$9.03	3000
100	T4	GY8.6	41668-5	†	BC100W/T4/120V/CAPSULE	120	12	Blister Card	C, C-8	2¼	2500	—	1650	2.3	$12.05	3000
Halogen Low-Voltage Capsule Lamp Blister-Carded (95)																
10	T3	G4	41567-9	†	BC10W/T3/12V	12	12	Blister Card	C, C-8	1¼	2000	—	100	1.8	$1.20	3000
20	T3	G4	41566-1	†	BC20W/T3/12V	12	12	Blister Card	C, C-8	1¼	2000	—	250	1.8	$2.41	3000
30	T4	GY6.35	41882-2	†	BC30T4/HES/12V	12	12	Blister Card	C, C-8	1¾	4000	—	750	3.7	$3.61	3000
50	T4	GY6.35	41559-6	†	BC50W/T4/12V	12	12	Blister Card	C, C-8	1¾	2000	—	700	1.8	$6.02	3000
75	T4	GY6.35	41558-8	†	BC75W/T4/12V	12	12	Blister Card	C, C-8	1¾	2000	—	1100	1.8	$9.03	2800

For the most current product information, go to the e-catalog on **www.philips.com**

Halogen symbols and footnotes located on page 109



Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
Halogen Low-Voltage Landscape Capsule Lamp Blister-Carded (95)													FTC REQUIREMENTS¥			
10	T3	G4	41567-9	†	BC10W/T3/LAND/TP	12	12	Blister Card	C, C-8	1¼	2000	—	100	1.8	$1.20	3000
20	T3	G4	41720-4	†	BC20W/T3/LAND/TP	12	12	Blister Card	C, C-8	1¼	2000	—	250	1.8	$2.41	3000
50	T4	GY6.35	41710-5	†	BC50W/T4/12V	12	48	Blister Card	C, C-8	1¼	2000	—	465	1.8	$6.02	2800
Halogen Low-Voltage Capsule Lamp																
All Lamps Contain UV Block and are Low Pressure (95)																
10	T3	G4	23262-9		10W/T3/12V	12	100	Capsule Type 13284	C, C-8	1¼	2000	—	140	1.8	$1.20	2850
20	T3	G4	23264-5		20W/T3/12V	12	100	Capsule Type 13078	C, C-8	1¼	2000	—	320	1.8	$2.41	3000
35	T4	GY6.35	29553-5		35W/T4/12V	12	100	Capsule Type 13103	C, C-8	1¾	2000	—	600	1.8	$4.22	3000
50	T4	GY6.35	23265-2		50W/T4/12V	12	100	Capsule Type 13079	C, C-8	1¾	2000	—	800	1.8	$6.02	2800

For the most current product information, go to the e-catalog on **www.philips.com**

Halogen symbols and footnotes located on page 109



T3
G4



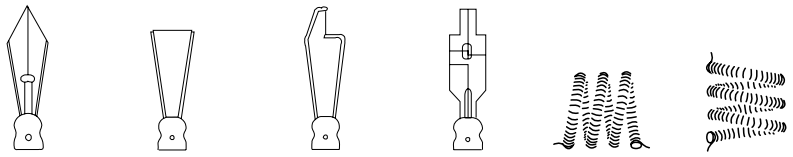
T4
GY6.35

Halogen Lamps

Filament Designations, Base Types and Bulb Shapes

Filament Designations (Not Actual Sizes)

Filament Designations consist of a letter or letters to indicate how the wire is coiled and an arbitrary number sometimes followed by a letter to indicate the arrangement of the filament on the supports. Prefix letters include C (coil) — wire is wound into a helical coil or it may be deeply fluted; CC (coiled coil) — wire is wound into a helical coil and this coiled wire again wound into a helical coil. Some of the more commonly used types of filament arrangements are illustrated.



C-2V
CC-2V

C-6
CC-6

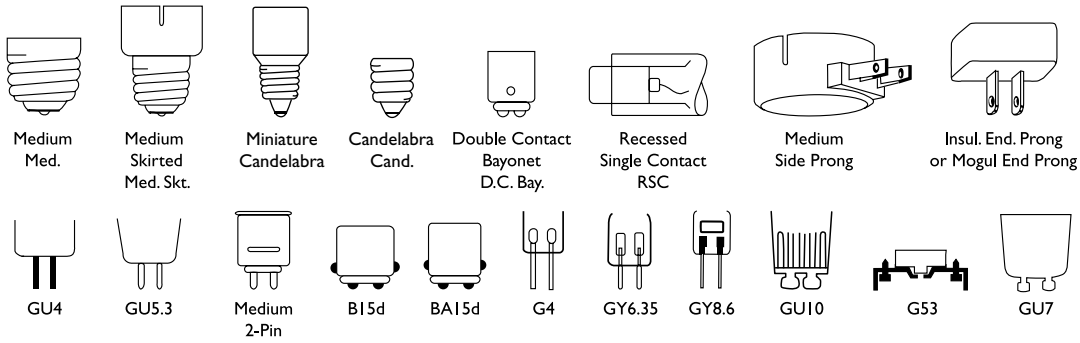
C-8
CC-8

2CC-8

CC-6

CC-8

Base Types (Not Actual Sizes)



Medium
Med.

Medium
Skirted
Med. Skt.

Miniature
Candelabra

Candelabra
Cand.

Double Contact
Bayonet
D.C. Bay.

Recessed
Single Contact
RSC

Medium
Side Prong

Insul. End. Prong
or Mogul End Prong

GU4

GU5.3

Medium
2-Pin

B15d

BA15d

G4

GY6.35

GY8.6

GU10

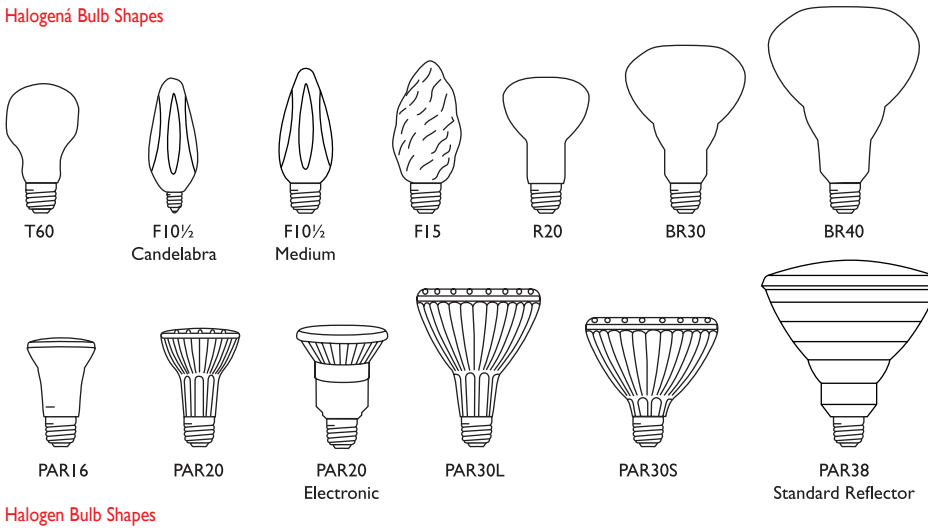
G53

GU7

Bulb Shapes (Not Actual Sizes)

The size and shape of a bulb is designated by a letter or letters followed by a number. The letter indicates the shape of the bulb while the number indicates the diameter of the bulb in eighths of an inch. For example, "T10" indicates a tubular shaped bulb having a diameter of 1⅛ or 1¼ inches. The following illustrations show some of the more popular bulb shapes and sizes.

Halogená Bulb Shapes



T60

F10½
Candelabra

F10½
Medium

F15

R20

BR30

BR40

PAR16

PAR20

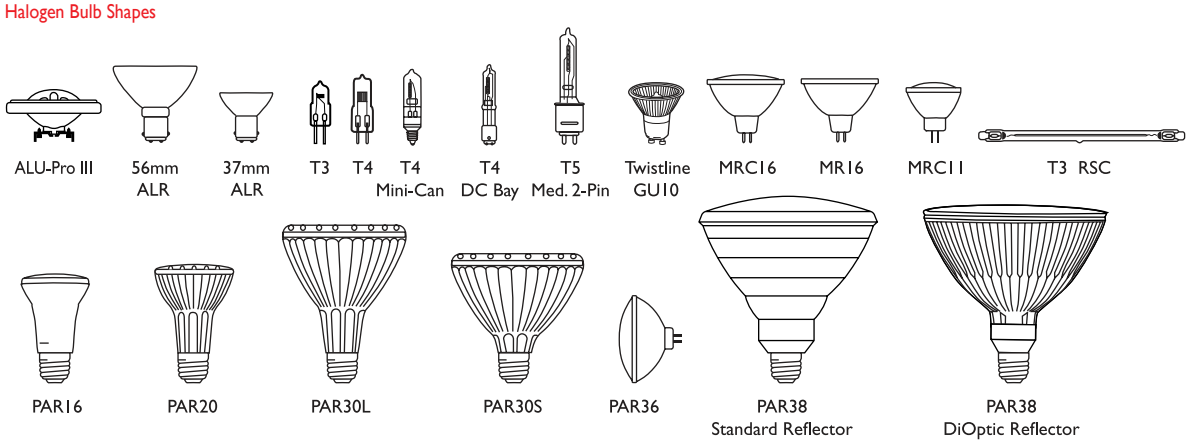
PAR20
Electronic

PAR30L

PAR30S

PAR38
Standard Reflector

Halogen Bulb Shapes



ALU-Pro III

56mm
ALR

37mm
ALR

T3

T4

T4
Mini-Can

T4
DC Bay

T5
Med. 2-Pin

Twistline
GU10

MRC16

MR16

MRC11

T3 RSC

PAR16

PAR20

PAR30L

PAR30S

PAR36

PAR38
Standard Reflector

PAR38
DiOptic Reflector

For the most current product information, go to the e-catalog on www.philips.com

□ Exclusive to Philips Lighting Company

▯ Maximum Beam Candlepower

℮ This Bulb Meets US Federal Minimum Efficiency Standards

† New since last printing

* Two Lamp Carded Pack

‡ Quantity shown is minimum shipping container—refer to Net Price Schedule for number of lamps to qualify as a standard case

¥ For more information about FTC requirements please see rule 16 CFR part 305 @ www.ftc/os/2000/02/16cfr305

(82) CAUTION: To avoid deterioration of lampholder by heat, use only heat resistant lampholders or fixtures listed by a nationally recognized electrical testing organization for use with reflector or PAR lamps.

(86) PAR Halogen Caution Notice: Before using bulb, see operating instructions on inside flap. Adherence to the operating instructions will reduce the risk of personal injury or fire. The filament capsule contained inside this glass bulb is pressurized, operates at high temperature and could unexpectedly shatter. Should the outer bulb break, particles of extremely hot glass could be discharged into the fixture and/or the surrounding environment, thereby creating a risk of personal injury or fire. **Operating Instructions:** Before replacing, turn off power and let lamp cool to avoid electrical shock or burn.

— For indoor or outdoor use. A weather-protected fixture is recommended for wet locations.
— Suitable for use in open fixtures.
— Do not exceed the maximum wattage rating of the fixture.
— Do not use if outer glass is scratched or broken since it may break during operation or removal.
— If outer glass breaks the lamp may continue to light, however, immediately discontinue use.
— Due to the heat that radiates from the bulb, do not use in close proximity to combustible materials or objects susceptible to drying or fading.
— Manage in accord with disposal laws.

(88) OPERATING INSTRUCTIONS: Before replacing, turn off power and let lamp cool to avoid electrical shock or burn. Do not allow hot bulb to come in contact with liquid or metal parts of the fixture as glass may shatter. Suitable for use in open fixtures. Do not exceed the maximum wattage rating of the fixture. Do not use if outer glass is scratched or broken since it may break during operation or removal. If outer glass breaks the lamp may continue to light, however, immediately discontinue use. Due to the heat that radiates from the bulb, do not use in close proximity to combustible materials or objects susceptible to drying or fading. Manage in accord with disposal laws.

CAUTION: Before using bulb, see operating instructions. Adherence to the operating instructions will reduce the risk of personal injury or fire. The filament capsule contained inside this glass bulb is pressurized, operates at high temperature and could unexpectedly shatter. Should the outer bulb break, particles of extremely hot glass could be discharged into the fixture and/or the surrounding environment, thereby creating a risk of personal injury or fire.

(91) CAUTION: Do not touch inner capsule with bare hands. Fingerprints may result in shorter life. Remove fingerprints with alcohol. **THIS LAMP IS PRESSURIZED AND COULD SHATTER** so to avoid injury and to avoid exposure to ultraviolet radiation, use only in fixtures that provide a protective shield of tempered glass. Provide adequate ventilation to ensure that seal temperature does not exceed 350°C and use only in fixtures rated for the wattage stated on this package. To avoid risks of burns or other injury, turn power off and allow lamp to fully cool before attempting to replace. Socket condition may affect lamp life. Inspect and replace socket if deterioration has occurred.

(92) CAUTION: THIS LAMP IS PRESSURIZED AND COULD SHATTER. Should the outer bulb break, particles of extremely hot glass could be discharged into the fixture and/or the surrounding environment, thereby creating a risk of personal injury or fire. Provide adequate ventilation to ensure that seal temperature does not exceed 350°C and use only in fixtures rated for the wattage stated on this package. To avoid risks of burns or other injury, turn power off and allow lamp to fully cool before attempting to replace. Socket condition may affect lamp life. Inspect and replace socket if deterioration has occurred.

(93) Rated average life is the length of operation (in hours) at which point an average of 50% of the lamps will still be operational and 50% will not.

(95) NOTICE: Do not touch bulb with bare hands. Fingerprints may result in shorter life. Remove fingerprints with alcohol.

CAUTION: THIS LAMP IS PRESSURIZED AND COULD SHATTER so to avoid injury and to avoid exposure to ultraviolet radiation, use only in fixtures that provide a protective shield of tempered glass. Provide adequate ventilation to ensure that seal temperature does not exceed 350° C and use only in fixtures rated for the wattage stated on this package. To avoid risks of burns or other injury, turn power off and allow lamp to fully cool before attempting to replace. Socket condition may affect lamp life. Inspect and replace socket if deterioration has occurred.

(96) Operating Instructions: Do not use lamp in close proximity to combustible materials. If used outdoors, use in an enclosed fixture only. If used indoors, no additional shield is required. Can be operated in all positions.

CAUTION: Read operating instructions before use. If outer glass breaks, turn power off immediately and avoid touching any metal components. To avoid potential burn and electrical shock during lamp replacement, always turn power off and let lamp cool before replacing bulb.

(97) Operating Instructions: Before replacing, turn off power and let lamp cool to avoid electrical shock or burn. For indoor use only. Do not allow hot bulb to come in contact with liquid or metal parts of the fixture as glass may shatter. Do not exceed the maximum wattage rating of the fixture. Do not use if outer glass is scratched or broken since it may break during operation or removal. If outer glass breaks the lamp may continue to light, however, immediately discontinue use. Due to the heat that radiates from the bulb, do not use in close proximity to combustible materials or objects susceptible to drying or fading. Manage in accord with disposal laws.

CAUTION: Adherence to the operating instructions will reduce the risk of personal injury or fire. The filament capsule contained inside this glass bulb is pressurized, operates at high temperature and could unexpectedly shatter. Should the outer bulb break, particles of extremely hot glass could be discharged into the fixture and/or the surrounding environment, thereby creating a risk of personal injury or fire.

(98) NOTICE: This twistline has a GU10 base and may be used in fixtures that have either GU10 or GZ10 sockets. **Operating Instructions:** Do not use in close proximity to combustible materials or objects adversely affected by drying or fading. Can be operated in all positions.

CAUTION: THIS LAMP IS PRESSURIZED AND COULD SHATTER so to avoid injury and to avoid exposure to ultraviolet radiation, this lamp should be used in a fixture that provides a protective shield of tempered glass. If outer glass breaks, immediately discontinue use. Always turn power off and let lamp cool before removal to avoid potential burn or electric shock.

(99) WARNING: BULB OPERATES AT VERY HIGH TEMPERATURES AND MUST BE USED PROPERLY TO AVOID/REDUCE RISK OF FIRE. Do not use bulbs greater than 300 watts in indoor residential fixtures. Use only in fixtures specifying this bulb type and that meet revised UL 153 standard for tungsten-halogen torchiere lamps. Bulb is pressurized and could shatter and should only be used in fixtures that provide a protective shield of tempered glass. To avoid exposure to ultraviolet radiation which could cause skin and eye irritation use only in fixtures that provide a protective shield of tempered glass.
NOTICE: Do not touch bulb with bare hands. Fingerprints may result in reduced performance unless they are removed with alcohol. When operating, bulb is hot. To avoid risks of burns or injury, turn power off and allow bulb to cool before replacing. Socket conditions may affect bulb life. Inspect and replace socket if deterioration has occurred. Provide adequate ventilation to ensure that seal temperature does not exceed 350°C. **TO AVOID/REDUCE RISK OF FIRE, DO NOT USE NEAR COMBUSTIBLE MATERIALS.**

(102) Complies with CEC-140-2008-001, Part 1605.2 State Standards for Federally Regulated Appliances, Table K-3. For more information go to www.energy.ca.gov/siting/title20/.

(103) Complies with the Energy Independence and Security Act of 2007 (Public Law 110-140). Section 321—Efficient Light Bulbs.

(104) Complies with the Energy Independence and Security Act of 2007 (Public Law 110-140), Section 322—Incandescent Reflector Lamp Efficiency Standards.

(445) Estimated energy cost is based on 3 hrs/day, 11¢/kWh. Cost depends on rates and use.

(446) Life in years is based on 3 hrs/day.

Halogen and Incandescent Replacement Guide

General Service Incandescent Lamps affected by EISA Section 321*

Banned by Legislation		Professional and Consumer Replacement	
Product Number	Ordering Code	Product Number	Ordering Code
13254-8	100A/W 12/4	40982-1	72A19/EV
13255-5	100A/W/TP 24/4	40982-1	72A19/EV
13423-9	100G25/W/LL 12/1	—	—
13560-8	75A/NTL 12/4	22696-9	53A19/EV/NTL
13561-6	100A/NTL 12/4	22699-3	72A19/EV/NTL
13684-6	100A	40982-1	72A19/EV
13996-3	75A/CL 120/1 PRO	41048-0	72A19/EV/CL
13997-1	75A 120/1 PRO	40982-1	72A19/EV
13998-9	100A/CL 120/1 PRO	41048-0	72A19/EV/CL
13999-7	100A 120/1 PRO	40982-1	72A19/EV
14297-5	200/99IF	—	—
14997-0	75A/W 12/4	40982-1	72A19/EV
15000-3	75A-67A/99/EW	40982-1	72A19/EV
15001-1	100A-90A/99EW	40982-1	72A19/EV
15002-9	150A-135A/99/EW	—	—
15008-6	100A/CL/LL 12/2	41048-0	72A19/EV/CL
15009-4	150A/CL/LL 12/1 TP	—	—
15129-0	75A/NTL/2X 12/4	22696-9	53A19/EV/NTL
15130-8	100A/NTL/2X 12/4	22699-3	72A19/EV/NTL
16739-5	75A/WL 24/4	40982-1	72A19/EV
16740-3	100A/WL 24/4	40982-1	72A19/EV
16801-3	75A/CL/LL 12/2	41048-0	72A19/EV/CL
16844-3	100F20/POSTLT/CL/LL 6/1	42385-5	BC72F15/EV/CL
16850-0	100G30/W/LL 6/1	—	—
16862-5	100A/WL 12/4	40982-1	72A19/EV
16866-6	150A/WL 12/1	—	—
16879-9	75A/WL 12/4	40982-1	72A19/EV
21386-8	BC70BT15/HAL/W	40982-1	72A19/EV
21443-7	38A/W/TP 12/4	40984-7	43A19/EV
21444-5	38A/CL	41050-6	29A19/EV/CL
21446-0	38A/CL/LL 12-2 WP TP	41050-6	29A19/EV/CL
21447-8	38A/WL/TP 12/4	40983-9	29A19/EV
21452-8	57A/CL/LL/TP 12/2	41049-8	43A19/EV/CL
21453-6	71A/W/TP 24/4	40982-1	72A19/EV
21454-4	71A	40982-1	72A19/EV
21455-1	71A/CL/LL 120V 12/2 WP TP	41048-0	72A19/EV/CL
21459-3	95A	40982-1	72A19/EV
21460-1	95A/W 24/4	40982-1	72A19/EV
21461-9	95A/WL 24/4	40982-1	72A19/EV
21463-5	57A/CL	40984-7	43A19/EV
21466-8	57A	40984-7	43A19/EV
21469-2	71A	40982-1	72A19/EV
21470-0	71A/CL	41048-0	72A19/EV/CL
21473-4	95A/CL	41048-0	72A19/EV/CL
21474-2	95A	40982-1	72A19/EV
21497-3	57A 12/4	40984-7	43A19/EV
21498-1	57A/W/TP 12/4	40984-7	43A19/EV
21499-9	57A/WL 12/4 TP	40984-7	43A19/EV
21501-2	71A/W/TP 12/4	40982-1	72A19/EV

* EISA Section 321 refers to energy efficiency standards for general service incandescent lamps.

Halogen and Incandescent Replacement Guide

General Service Incandescent Lamps affected by EISA Section 321*

Banned by Legislation		Professional and Consumer Replacement	
Product Number	Ordering Code	Product Number	Ordering Code
21502-0	71A/WL 24/4	40982-1	72A19/EV
21503-8	71A/WL /TP 12/4	40982-1	72A19/EV
21504-6	95A/W/TP 12/4	40982-1	72A19/EV
21818-0	95A/WL 12/4	40982-1	72A19/EV
22240-6	75A-67A/EW	40982-1	72A19/EV
22241-4	75A-67A/EW	40982-1	72A19/EV
22243-0	100A-90A/EW	40982-1	72A19/EV
22244-8	100A-90A/EW	40982-1	72A19/EV
22430-3	100A23	—	—
22979-9	100A/99	40982-1	72A19/EV
23415-3	75A 120V 24-2LP/SL W/P	40982-1	72A19/EV
24135-6	75A/WL	40982-1	72A19/EV
24927-6	BC75BT15/HAL/W	40982-1	72A19/EV
24931-8	BC100BT15/HAL/W	40982-1	72A19/EV
26836-7	135A25/35	—	—
27069-4	150A	—	—
27083-5	75A 12/4	40982-1	72A19/EV
28171-7	100A21	—	—
28172-5	150A23	—	—
28173-3	150	—	—
28174-1	150PS25/99	—	—
28175-8	150A-135A/EW	—	—
31305-6	75A21	—	—
37406-6	75A/99	40982-1	72A19/EV
37411-6	100A21/35	—	—
37417-3	150A/99	—	—
37460-3	100A21/99	—	—
37472-8	75A	40982-1	72A19/EV
37473-6	75A	40982-1	72A19/EV
37474-4	100A	40982-1	72A19/EV
37476-9	100A	40982-1	72A19/EV
37485-0	75A/W 12/4	40982-1	72A19/EV
37486-8	75A/W/TP 24/4	40982-1	72A19/EV
37525-3	75A/CL	41048-0	72A19/EV/CL
37527-9	100A/CL	41048-0	72A19/EV/CL
40948-2	57A/W/TP	40984-7	43A19/EV

* EISA Section 321 refers to energy efficiency standards for general service incandescent lamps.

Halogen and Incandescent Replacement Guide

Incandescent Reflector Lamps Affected by EISA Section 322 & DOE Rulemaking*

Banned by Legislation		Professional Replacement		Consumer Replacement	
Product #	Ordering Code	Product #	Ordering Code	Product #	Ordering Code
13401-5	45PAR38/HAL/FL/LL	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
13402-3	90PAR38/HAL/FL/LL	13862-8	70PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
13403-1	90PAR38/HAL/FL/LL	13862-8	70PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
13404-9	45PAR38/HAL/SP/LL	23844-4	39PAR38/IRC+/SP10	41943-2	39PAR38/EV/SP10
13405-6	90PAR38/HAL/SP/LL	13861-0	70PAR38/IRC+/SP10	41938-2	72PAR38/EV/SP10
13407-2	50PAR30L/HAL/FL/LL	23429-4	50PAR30L/IRC+/FL25	41974-7	39PAR30L/EV/FL25
13408-0	75PAR30L/HAL/FL/LL	23429-4	50PAR30L/IRC+/FL25	41954-9	53PAR30L/EV/FL25
13409-8	75PAR30L/HAL/SP/LL	23799-0	50PAR30L/IRC+/SP10	41956-4	53PAR30L/EV/SP10
13410-6	50PAR20/HAL/FL/LL	15216-5	20PAR20E/HAL/FL25	41986-1	39PAR20/EV/FL25
13411-4	50PAR20/HAL/SP/LL	15216-5	20PAR20E/HAL/FL25	41973-9	39PAR20/EV/SP10
13467-6	75PAR30S/HAL/FL25	23856-8	55PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
13846-1	50PAR20/HAL/SP10	40494-7	20PAR20E/HAL/SP10	41973-9	39PAR20/EV/SP10
13848-7	75PAR30L/HAL/SP10	23799-0	50PAR30L/IRC+/SP10	41956-4	53PAR30L/EV/SP10
13849-5	75PAR30S/HAL/SP10	23855-0	55PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10
13853-7	50PAR30S/IRC/HAL/SP10	23853-5	39PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10
13854-5	50PAR30S/IRC/HAL/FL25	23854-3	39PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
13855-2	50PAR30S/IRC/HAL/WFL40	23854-3	39PAR30S/IRC+/FL25	—	—
13856-0	45PAR38/IRC/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
13857-8	45PAR38/IRC/HAL/WFL40	23849-3	55PAR38/IRC+/WFL40	—	—
13858-6	55PAR38/IRC/HAL/SP10	14505-2	50PAR38/IRC+/SP10	41945-7	53PAR38/EV/SP10
13859-4	55PAR38/IRC/HAL/FL25	14506-0	50PAR38/IRC+/FL25	41944-0	53PAR38/EV/FL25
13860-2	55PAR38/IRC/HAL/WFL40	14507-8	50PAR38/IRC/WFL40	—	—
13864-4	90PAR38/IRC/HAL/SP10	13861-0	70PAR38/IRC+/SP10	—	—
13865-1	90PAR38/IRC/HAL/FL25	13862-8	70PAR38/IRC+/FL25	42498-5	83PAR38/EV/FL25/LL
13866-9	90PAR38/IRC/HAL/WFL40	13863-6	70PAR38/IRC+/WFL40	—	—
13873-5	60PAR38/IRC/HAL/SP10	23847-7	55PAR38/IRC+/SP10	41938-2	72PAR38/EV/SP10
13874-3	60PAR38/IRC/HAL/FL25	23865-9	55PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
13875-0	60PAR38/IRC/HAL/WFL40	23849-3	55PAR38/IRC+/WFL40	—	—
13879-2	60PAR38/IRC/HAL/FL25	23865-9	55PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
13918-8	60PAR38/IRC/HAL/WFL40	23849-3	55PAR38/IRC+/WFL40	—	—
13919-6	45PAR38/IRC/HAL/SP10	23844-4	39PAR38/IRC+/SP10	41943-2	39PAR38/EV/SP10
13920-4	60PAR38/IRC/HAL/SP10	23847-7	55PAR38/IRC+/SP10	41938-2	72PAR38/EV/SP10
14022-8	60PAR38/HAL/FL/LL	23845-1	39PAR38/IRC+/FL25	42128-9	39PAR38/EV/FL25/LL
14482-4	60PAR38/HAL/SP10	23844-4	39PAR38/IRC+/SP10	41944-0	53PAR38/EV/FL25
14483-2	60PAR38/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41945-7	53PAR38/EV/SP10
14484-0	60PAR38/HAL/WFL40	23849-3	55PAR38/IRC+/WFL40	—	—
14485-7	75PAR38/HAL/SP10	23847-7	55PAR38/IRC+/SP10	41945-7	53PAR38/EV/SP10
14486-5	75PAR38/HAL/FL25	23865-9	55PAR38/IRC+/FL25	41944-0	53PAR38/EV/FL25
14487-3	90PAR38/HAL/WFL40	13863-6	70PAR38/IRC+/WFL40	—	—
14488-1	60PAR38/HAL/SP10	23844-4	39PAR38/IRC+/SP10	41944-0	53PAR38/EV/FL25
14489-9	60PAR38/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41945-7	53PAR38/EV/SP10
14490-7	60PAR38/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41945-7	53PAR38/EV/SP10
14491-5	60PAR38/HAL/WFL40	23849-3	55PAR38/IRC+/WFL40	—	—
14493-1	75PAR38/HAL/SP10	23847-7	55PAR38/IRC+/SP10	41945-7	53PAR38/EV/SP10
14494-9	75PAR38/HAL/FL25	23865-9	55PAR38/IRC+/FL25	41944-0	53PAR38/EV/FL25
14495-5	90PAR38/HAL/WFL40	13863-6	70PAR38/IRC+/WFL40	—	—
14496-3	40PAR30S/IRC/HAL/SP10	23853-5	39PAR30S/IRC+/SP10	42111-5	39PAR30S/EV/SP10
14497-1	40PAR30S/IRC/HAL/FL25	23854-3	39PAR30S/IRC+/FL25	42110-7	39PAR30S/EV/FL25
14498-9	40PAR30S/IRC/HAL/WFL40	23854-3	39PAR30S/IRC+/FL25	42110-7	39PAR30S/EV/FL25
14499-7	50PAR30S/IRC+/SP10	23853-5	39PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10
14500-3	50PAR30S/IRC+/FL25	23854-3	39PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
14501-1	50PAR30S/IRC+/WFL40	23854-3	39PAR30S/IRC+/FL25	—	—
14502-9	40PAR38/IRC/HAL/SP10	23844-4	39PAR38/IRC+/SP10	41943-2	39PAR38/EV/SP10
14503-7	40PAR38/IRC/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
14504-5	40PAR38/IRC/HAL/WFL40	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
14507-8	50PAR38/IRC/HAL/WFL40	23849-3	55PAR38/IRC+/WFL40	—	—
14720-7	75PAR38/NLP/FL	23865-9	55PAR38/IRC+/FL25	41944-0	53PAR38/EV/FL25
14989-8	60PAR30S/IRC/HAL/WFL40	23857-6	55PAR30S/IRC+/WFL40	—	—
15004-5	60PAR30S/IRC/HAL/SP10	23855-0	55PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10

* EISA Section 322 & DOE Rulemaking refers to energy efficiency standards for incandescent reflector lamps.

Halogen and Incandescent Replacement Guide

Incandescent Reflector Lamps affected by EISA Section 322 & DOE Rulemaking*

Banned by Legislation		Professional Replacement		Consumer Replacement	
Product #	Ordering Code	Product #	Ordering Code	Product #	Ordering Code
15007-8	60PAR30S/IRC/HAL/FL25	23856-8	55PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
15879-0	60BR30/HAL/FL	21359-5	40BR30/HEA/FL	42118-0	50BR30/EV/FL
20231-7	45PAR38/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
20234-1	90PAR38/HAL/FL25	13862-8	70PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
20257-2	60BR30/HAL/NLP/FL	—	—	—	—
20573-2	60BR40/HAL/NLP/FL	—	—	—	—
20579-9	60BR30/HAL/FL/LL	21359-5	40BR30/HEA/FL	42118-0	50BR30/EV/FL
20580-7	60BR40/HAL/FL/LL	22238-0	40BR40/HEA/FL	42116-4	40BR40/EV/FL
22486-5	60K19/DL	—	—	—	—
22906-2	50PAR20/HAL/SP10	40494-7	20PAR20E/HAL/SP10	41973-9	39PAR20/EV/SP10
22911-2	50PAR20/HAL/FL25	15216-5	20PAR20E/HAL/FL25	41986-1	39PAR20/EV/FL25
22921-1	50PAR20/HAL/FL25	15216-5	20PAR20E/HAL/FL25	41986-1	39PAR20/EV/FL25
22922-9	50PAR30L/HAL/SP10	23799-0	50PAR30L/IRC+/SP10	42303-8	39PAR30L/EV/SP10
22923-7	50PAR30L/HAL/WSP16	23799-0	50PAR30L/IRC+/SP10	42303-8	39PAR30L/EV/SP10
22925-2	50PAR30L/HAL/FL25	23429-4	50PAR30L/IRC+/FL25	41942-4	39PAR38/EV/FL25
22926-0	50PAR30L/HAL/FL25	23429-4	50PAR30L/IRC+/FL25	41942-4	39PAR38/EV/FL25
22927-8	50PAR30L/HAL/WFL40	23800-6	50PAR30L/IRC+/WFL40	—	—
22928-6	50PAR30L/HAL/WFL40	23800-6	50PAR30L/IRC+/WFL40	—	—
22930-2	75PAR30L/HAL/SP10	23799-0	50PAR30L/IRC+/SP10	41956-4	53PAR30L/EV/SP10
22934-4	75PAR30L/HAL/WSP16	23799-0	50PAR30L/IRC+/SP10	41956-4	53PAR30L/EV/SP10
22941-9	75PAR30L/HAL/FL25	23429-4	50PAR30L/IRC+/FL25	41954-9	53PAR30L/EV/FL25
22943-5	75PAR30L/HAL/FL25	23429-4	50PAR30L/IRC+/FL25	41954-9	53PAR30L/EV/FL25
22944-3	75PAR30L/HAL/WFL40	23800-6	50PAR30L/IRC+/WFL40	—	—
22945-0	75PAR30L/HAL/WFL40	23800-6	50PAR30L/IRC+/WFL40	—	—
22946-8	45PAR38/HAL/SP10	23844-4	39PAR38/IRC+/SP10	41943-2	39PAR38/EV/SP10
22947-6	45PAR38/HAL/SP10	23844-4	39PAR38/IRC+/SP10	41943-2	39PAR38/EV/SP10
22949-2	45PAR38/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
23069-8	90PAR38/HAL/SP10	13861-0	70PAR38/IRC+/SP10	41938-2	72PAR38/EV/SP10
23650-5	90PAR38/HAL/SP10	13861-0	70PAR38/IRC+/SP10	41938-2	72PAR38/EV/SP10
23651-3	90PAR38/HAL/FL25	13862-8	70PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
26349-1	50PAR30S/HAL/SP10	23853-5	39PAR30S/IRC+/SP10	—	—
26357-4	50PAR30S/HAL/SP10	23853-5	39PAR30S/IRC+/SP10	—	—
26358-2	50PAR30S/HAL/FL25	23854-3	39PAR30S/IRC+/FL25	—	—
26362-4	50PAR30S/HAL/FL25	23854-3	39PAR30S/IRC+/FL25	—	—
26364-0	50PAR30S/HAL/WFL40	23854-3	39PAR30S/IRC+/FL25	—	—
26384-8	50PAR30S/HAL/WFL40	23854-3	39PAR30S/IRC+/FL25	—	—
26877-1	90PAR38/HAL/FL	13862-8	70PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
26883-9	45PAR38/HAL/FL	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
27429-0	90PAR38/HAL/FL	13862-8	70PAR38/IRC+/FL25	41946-5	72PAR38/EV/FL25
28479-4	75PAR30S/HAL/SP10	23855-0	55PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10
28488-5	75PAR30S/HAL/FL25	23856-8	55PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
28491-9	75PAR30S/HAL/WFL40	23857-6	55PAR30S/IRC+/WFL40	—	—
28492-7	75PAR30S/HAL/WFL40	23857-6	55PAR30S/IRC+/WFL40	—	—
30728-0	40K19/DL	—	—	—	—
35751-7	60PAR30S/HAL/SP10	23855-0	55PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10
35752-5	60PAR30S/HAL/SP10	23855-0	55PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10
35753-3	60PAR30S/HAL/FL25	23856-8	55PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
35758-2	60PAR30S/HAL/WFL40	23857-6	55PAR30S/IRC+/WFL40	—	—
35762-4	60PAR30S/HAL/WFL40	23857-6	55PAR30S/IRC+/WFL40	—	—
35788-9	60PAR30S/HAL/FL25	23856-8	55PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
38849-6	60BR30/HAL/FL	21359-5	40BR30/HEA/FL	42118-0	50BR30/EV/FL
38875-1	60BR30/HAL/SP	—	—	—	—
38884-3	60PAR38/HAL/2FL	—	—	—	—
38886-8	90PAR38/HAL/2FL	—	—	—	—
38887-6	60PAR38/HAL/3FL	38890-0	90PAR38/HAL/3FL	—	—
38925-4	90PAR38/HAL/FL	13862-8	70PAR38/IRC+/FL25	41941-6	72PAR38/EV/FL25
39174-8	60BR40/HAL/FL	22238-0	40BR40/HEA/FL	42116-4	40BR40/EV/FL

* EISA Section 322 & DOE Rulemaking refers to energy efficiency standards for incandescent reflector lamps.

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Create a brighter standard

Dramatically changing the look of a room can be as easy as changing a light bulb.

Natural Light Lamps help you see things the way they should be. Natural Light's distinctive blue coating reduces dull light effects to provide light that is more vibrant and natural.

DuraMax Long Life Lamps reduce the hassle of replacing light bulbs every few months, since all DuraMax products last longer than standard incandescent light bulbs.

Philips family of Specialty Incandescents provide the perfect light for accent and display lighting as well as general lighting in a variety of applications. From tubular shapes and appliance bulbs, to colored lamps for special effects, this family of lamps is ideal for professional and consumer applications.

Current Product	Philips Upgrade Product	Benefit	Page
Incandescent A19	Natural Light A19	• Vibrant light similar to natural daylight • Distinctive blue coating reduces dull light effects	119
40W R20 Incandescent	DuraMax R20 Flood	• Long life lighting reduces the hassle of replacing bulbs • Soft, white accent light is suited for indoor track, recessed and pendant fixtures	117

Incandescent Lamps

DuraMax Long Life

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
DuraMax Long Life Soft White																FTC REQUIREMENTS¥	
15	A15	Med.	16860-9	▲	15A/WL 12/2	120	24	Soft White Long Life	B, C-9		3½	3000		115	2.7	$1.81	
25	A19	Med.	16868-2	▲	25A/WL 12/2	120	24	Soft White Long Life	C, CC-6		4⅞	3000		235	2.7	$3.01	
30	A21	3 Ct. Med.	16947-4	(8)▲	30/100A/WL 12/1	120	12	Soft White Long Life 3-Way	C, 2CC-8		5⅝	1750		270	1.6	$3.61	2600
70														840		$8.43	2710
100														1110		$12.05	2680
40	A19	Med. ++	16737-9	▲	40A/WL 24/4	120	96	Soft White Long Life	C, CC-6		4⅞	1500		465	1.4	$4.82	2650
50	A21	3 Ct. Med.	16948-2	(8)▲	50/150A/WL 12/1	120	12	Soft White Long Life 3-Way	C, 2CC-8		5⅝	1750		465	1.6	$6.02	2720
100														1165		$12.05	2810
150														1665		$18.07	2780
50	A21	3 Ct. Med.	16949-0	(8)▲	50/250A/WL 12/1	120	12	Soft White Long Life	C, 2CC-8		5⅝	1750		420	1.6	$6.02	2730
200														2235		$24.09	2860
250														2715		$30.11	2820
60	A19	Med. ++	16874-0	▲	60A/WL 12/4	120	48	Soft White Long Life	C, CC-6		4⅞	1500		830	1.4	$7.23	2750
200	A21	Med.	16867-4	▲	200A/WL 6/1	120	6	Soft White Long Life	C, CC-8		5⅝	1500		3100	1.4	$24.09	
DuraMax Long Life Globes																	
25	G25	Med.	16748-6	▲	25G25/W/LL 12/1	120	12	White Long Life Globe	C, CC-6		4⅞	2000		210	1.8	$3.01	2600
			16887-2	▲	25G25/CL/LL 12/1	120	12	Clear Long Life Globe	C, CC-6		4⅞	2000		235	1.8	$3.01	2500
			16901-1	▲	25G25/CL/LL 4/3	120	12	Clear Long Life Globe	C, CC-6		4⅞	2000		235	1.8	$3.01	2500
			16902-9	▲	25G25/W/LL 4/3	120	12	White Long Life Globe	C, CC-6		4⅞	2000		210	1.8	$3.01	2600
40	G25	Med.	16903-7	▲	40G25/CL/LL 4/3	120	12	Clear Long Life Globe	C, CC-6		4⅞	2000		460	1.8	$4.82	2550
			16904-5	▲	40G25/W/LL 4/3	120	12	White Long Life Globe	C, CC-6		4⅞	2000		415	1.8	$4.82	2600
			16746-0	▲	40G25/W/LL 12/1	120	12	White Long Life Globe	C, CC-6		4⅞	2000		415	1.8	$4.82	2600
			16747-8	▲	40G25/CL/LL 12/1	120	12	Clear Long Life Globe	C, CC-6		4⅞	2000		460	1.8	$4.82	2550
	G40	Med.	16857-5	▲	40G40/CL/LL 6/1	120	6	Clear Long Life Globe	C, C-9		6⅛	3000		372	2.7	$4.82	
			16858-3	▲	40G40/W/LL 6/1	120	6	White Long Life Globe	C, C-9		6⅛	3000		335	2.7	$4.82	
60	G25	Med.	16749-4	▲	60G25/W/LL 12/1	120	12	White Long Life Globe	C, CC-6		4⅞	2000		665	1.8	$7.23	2670
			16896-2	▲	60G25/CL/LL 12/1	120	12	Clear Long Life Globe	C, CC-6		4⅞	2000		705	1.8	$7.23	2670
			16899-6	▲	60G25/CL/LL 4/3	120	12	Clear Long Life Globe	C, CC-6		4⅞	2000		705	1.8	$7.23	2670
			16900-3	▲	60G25/W/LL 4/3	120	12	White Long Life Globe	C, CC-6		4⅞	2000		665	1.8	$7.23	2670
	G30	Med.	16849-2	▲	60G30/W/LL 6/1	120	6	White Long Life Globe	C, C-9		5½	3000		550	2.7	$7.23	2650
	G40	Med.	16851-8	▲	60G40/W/LL 6/1	120	6	White Long Life Globe	C, C-9		6⅛	3000		595	2.7	$7.23	2550
			16852-6	▲	60G40/CL/LL 6/1	120	6	Clear Long Life Globe	C, C-9		6⅛	3000		665	2.7	$7.23	2550
100	G40	Med.	16853-4	▲	100G40/W/LL 6/1	120	6	White Long Life Globe	C, C-9		6⅛	3000		985	2.7	$12.05	

For the most current product information, go to the e-catalog on **www.philips.com**
Incandescent symbols and footnotes located on page 132



Incandescent Lamps

DuraMax Long Life

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
																FTC REQUIREMENTS¥	
DuraMax Long Life Reflectors (87)																	
30	R20	Med.	16753-6	▲	30R20/LL 12/1	120	12	Frost Long Life Reflector	C, CC-6		3 1⁄16	2500	350	205	2.3	$3.61	2550
45	R20	Med.	20323-2	▲	45R20/LL 12/1	120	12	Long Life Reflector Flood	C, CC-6		3 1⁄16	2500		385	2.3	$5.42	
	BR30	Med.	16751-0	▲	45BR30/FL55/LL 12/1	120	12	Long Life Reflector Flood	C, CC-6		5⅜	2500		330	2.3	$5.42	2600
65	BR30	Med.	16768-4	▲	65BR30/FL55/LL 12/1	120	12	Long Life Reflector Flood	C, CC-6		5⅜	2500	510	610	2.3	$7.83	2690
			16769-2	▲	65BR30/SP20/LL 12/1	120	12	Long Life Reflector Spot	C, CC-6		5⅜	2500	530	620	2.3	$7.83	2710
	BR40	Med.	16741-1	▲	65BR/FL60/LL 8/1	120	8	Long Life Reflector Flood	C, CC-6		6½	2500	500	625	2.3	$7.83	2740
DuraMax Long Life Sparkling Clear																	
40	A19	Med.	16797-2	▲ ++	40A/CL/LL 12/2	120	24	Clear Long Life	C, CC-6		4⅞	1500		460	1.4	$4.82	2670
60	A19	Med.	16794-0	▲ ++	60A/CL/LL 12/2	120	24	Clear Long Life	C, CC-6		4⅞	1500		865	1.4	$7.23	2760
200	A23	Med.	16798-0	▲	200A/CL/LL 6/1	120	6	Clear Long Life	C, CC-8		6⅝	1500		3400	1.4	$24.09	
DuraMax Long Life Fan Lights																	
40	A15	Med.	16934-2	▲ *	BC40A15/FAN/CL/LL 6/2	120	12	Clear Long Life Fan	C, C-9		3½	2000		395	1.8	$4.82	2700
			16935-9	▲ *	BC40A15/FAN/W/LL 6/2	120	12	White Long Life Fan	C, C-9		3½	2000		365	1.8	$4.82	2700
60	A15	Med.	16945-8	▲ *	BC60A15/FAN/W/LL 6/2	120	12	White Long Life Fan	C, C-9		3½	2000		570	1.8	$7.23	2500
			16946-6	▲ *	BC60A15/FAN/CL/LL 6/2	120	12	Clear Long Life Fan	C, C-9		3½	2000		630	1.8	$7.23	2700
DuraMax Long Life Decoratives (12)																	
15	BA9	Cand.	16811-2	▲ *	BC15BA9C/CL/LL 6/2	120	12	Clear Long Life Bent Tip	B, C-7A		4⅜	2000		110	1.8	$1.81	
	F10	Cand.	16830-2	▲ *	BC15F10C/CL/LL 6/2	120	12	Clear Long Life Flame	B, C-7A		3⅛	2000		95	1.8	$1.81	2450
25	BA9	Cand.	16719-7	▲	BC25BA9C/CL/LL 6/4	120	24	Clear Long Life Bent Tip	C, CC-2V, C-7A		4⅜	2000		150	1.8	$3.01	
			16806-2	▲ *	BC25BA9C/CL/LL 6/2	120	12	Clear Long Life Bent Tip	C, CC-2V, C-7A		4⅜	2000		150	1.8	$3.01	
			16810-4	▲ *	BC25BA9C/F/LL 6/2	120	12	Frost Long Life Bent Tip	C, CC-2V, C-7A		4⅜	2000		145	1.8	$3.01	
	BA9½	Med.	16819-5	▲ *	BC25BA9½/CL/LL 6/2	120	12	Clear Long Life Bent Tip	C, CC-2V, C-7A		4⅛	2000		150	1.8	$3.01	
	B10½	Cand.	16824-5	▲ *	BC25B10½C/CL/LL 6/2	120	12	Clear Long Life Blunt Tip	C, C-7A		4⅛	2000		150	1.8	$3.01	
	CA8	Cand.	13568-1	▲ *	BC25CA8C/CL/LL 6/2	120	12	Clear Petite Long Life Bent Tip	C, CC-2V		3½	2000		220	1.8	$3.01	2550

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Incandescent Lamps

DuraMax Long Life

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
DuraMax Long Life Decoratives Continued (12)															FTC REQUIREMENTS¥		
25	F10	Cand.	16832-8	▲ *	BC25F10C/CL/LL 6/2	120	12	Clear Long Life Flame	B, C-7A		3⅛	2000		105	1.8	$3.01	2500
	F15	Med.	16833-6	▲ *	BC25F15/CL/LL 6/2	120	12	Clear Long Life Flame	B, C-9		4½	2000		150	1.8	$3.01	
			16839-3	▲ *	BC25F15/IR/LL 6/2	120	12	Iridescent Long Life Flame	C, C-9		4½	2000		150	1.8	$3.01	
	G16½	Cand.	16845-0	▲ *	BC25G16½C/CL/LL 6/2	120	12	Clear Long Life Globe	B, C-7A		3	2000		200	1.8	$3.01	2500
			16847-6	▲ *	BC25G16½C/W/LL 6/2	120	12	White Long Life Globe	B, C-7A		3	2000		165	1.8	$3.01	2400
		Med.	13535-0	▲ *	BC25G16½/CL/LL 6/2	120	12	Clear Long Life Globe	C, CC-2V		2¾	2000		180	1.8	$3.01	2500
			13534-3	▲ *	BC25G16½/W/LL 6/2	120	12	White Long Life Globe	C, CC-2V		2¾	2000		160	1.8	$3.01	2400
40	BA9	Cand.	16720-5	▲	BC40BA9C/CL/LL 6/4	120	24	Clear Long Life Bent Tip	C, CC-2V, C-7A		4⅜	2000		300	1.8	$4.82	
			16807-0	▲ *	BC40BA9C/CL/LL 6/2	120	12	Clear Long Life Bent Tip	C, CC-2V, C-7A		4⅜	2000		300	1.8	$4.82	
			16809-6	▲ *	BC40BA9C/F/LL 6/2	120	12	Frost Long Life Bent Tip	C, CC-2V, C-7A		4⅜	2000		295	1.8	$4.82	
	BA9½	Med.	16760-1	▲	BC40BA9½/CL/LL 6/4	120	24	Clear Long Life Bent Tip	C, CC-2V, C-7A		4⅜	2000		300	1.8	$4.82	
			16820-3	▲ *	BC40BA9½/CL/LL 6/2	120	12	Clear Long Life Bent Tip	C, CC-2V, C-7A		4⅜	2000		300	1.8	$4.82	
	B10½	Cand.	16825-2	▲ *	BC40B10½C/CL/LL 6/2	120	12	Clear Long Life Blunt Tip	C, CC-2V		4⅜	2000		300	1.8	$4.82	
	B13	Med.	16828-6	▲ *	BC40B13/CL/LL 6/2	120	12	Clear Long Life Blunt Tip	C, C-7A		4⅜	2000		300	1.8	$4.82	
	F15	Med.	16835-1	▲ *	BC40F15/CL/LL 6/2	120	12	Clear Long Life Flame	C, C-9		4½	2000		385	1.8	$4.82	
			16837-7	▲ *	BC40F15/IR/LL 6/2	120	12	Iridescent Long Life Flame	C, C-9		4½	2000		370	1.8	$4.82	
			16838-5	▲ *	BC40F15/W/LL 6/2	120	12	White Long Life Flame	C, C-9		4½	2000		300	1.8	$4.82	
	G16½	Cand.	16846-8	▲ *	BC40G16½C/CL/LL 6/2	120	12	Clear Long Life Globe	C, CC-2V, C-7A		3	2000		300	1.8	$4.82	2550
			16848-4	▲ *	BC40G16½C/W/LL 6/2	120	12	White Long Life Globe	C, CC-2V, C-7A		3	2000		245	1.8	$4.82	2550
		Med.	13537-6	▲ *	BC40G16½/CL/LL 6/2	120	12	Clear Long Life Globe	C, CC-2V		2¾	2000		300	1.8	$4.82	2550
			13536-8	▲ *	BC40G16½/W/LL 6/2	120	12	White Long Life Globe	C, CC-2V		2¾	2000		270	1.8	$4.82	2550
60	BA9	Cand.	16808-8	▲ *	BC60BA9C/CL/LL 6/2	120	12	Clear Long Life Bent Tip	C, CC-2V, C-7A		4⅜	2000		550	1.8	$7.23	
			16721-3	▲	BC60BA9C/CL/LL 6/4	120	24	Clear Long Life Bent Tip	C, CC-2V, C-7A		4⅜	2000		550	1.8	$7.23	
			16805-4	▲ *	BC60BA9C/F/LL 6/2	120	12	Frost Long Life Bent Tip	C, CC-2V, C-7A		4⅜	2000		545	1.8	$7.23	
	BA9½	Med.	16822-9	▲ *	BC60BA9½/CL/LL 6/2	120	12	Clear Long Life Bent Tip	C, CC-2V, C-7A		4⅜	2000		505	1.8	$7.23	2590
	B10½	Cand.	16826-0	▲ *	BC60B10½C/CL/LL 6/2	120	12	Clear Long Life Blunt Tip	C, CC-2V		4⅜	2000		550	1.8	$7.23	
	F15	Med.	16842-7	▲ *	BC60F15/CL/LL 6/2	120	12	Clear Long Life Flame	C, C-9		4½	2000		660	1.8	$7.23	2700
	G16½	Cand.	16699-0	▲ *	BC60G16½C/CL/LL 6/2	120	12	Clear Long Life Globe	C, CC-2V		3	2000		540	1.8	$7.23	2700

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Incandescent Lamps

Natural Light

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
Natural Light Standard														FTC REQUIREMENTS¥			
40	A19	Med.	13558-2	▲	40A/NTL 12/4	120	48	Natural Light Standard	C, CC-6		4⅞	1000		370	0.9	$4.82	2980
60	A19	Med.	13559-0	▲	60A/NTL 12/4	120	48	Natural Light Standard	C, CC-6		4⅞	1000		640	0.9	$7.23	2790
Natural Light 3-Way																	
50	A21	3 Ct. Med.	13564-0	(8)▲	50/150A/NTL 12/1	120	12	Natural Light 3-Way	C, 2CC-6		5⅝	1200		490	1.1	$6.02	2590
100														1250		$12.05	3100
150														1740		$18.07	3050
Natural Light Globe																	
40	G25	Med.	13563-3	▲	40G25/NTL 6/1	120	6	Natural Light Globe	C, CC-6		4⅞	1500		320	1.4	$4.82	
Natural Light Fan																	
40	A15	Med.	13565-7	▲*	BC40A15/FAN/NTL 6/2	120	12	Natural Light Fan	C, C-9		3½	1500		340	1.4	$4.82	3200
Natural Light Reflector																	
65	BR30	Med.	13785-1	(87)▲	65BR30/FL/NTL 12/1	120	12	Natural Light Reflector	C, CC-6		5⅜	2000		535	1.8	$7.83	2730
Natural Light Decorative																	
40	B10½	Cand.	14125-9	(12)▲*	BC40B10½C/NTL 6/2	120	12	Natural Light Decorative	C, CC-2V, C-7A		4⅛	2000		270	1.8	$4.82	
	B13	Med.	14127-5	(12)▲*	BC40B13/NTL 6/2	120	12	Natural Light Decorative	C, C-7A, C-7A		4⅛	2000		270	1.8	$4.82	

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Natural Light A19 | Natural Light A21 3-Way | Natural Light G25 | Natural Light A15 | Natural Light BR30 | Natural Light B10½ | Natural Light B13

Incandescent Lamps

Incandescent Lamps by Wattage

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
														FTC REQUIREMENTS¥			
1.5	T3	Cand.	41666-9	▲† *	BC1.5T3	4.5	24	Clear Flashlight	B, C-6		2	30		17	0.0	$0.18	
4	C7	Cand.	25706-3	▲ *	BC4C7 12/2	120	24	Clear Night Light	B, C-7A		2⅛	3000		16	2.7	$0.48	
			24741-1	▲	BC4C7/4 12/4	120	48	Clear Night Light	B, C-7A		2⅛	3000		16	2.7	$0.48	
			25708-9	▲ *	BC4C7/W 12/2	120	24	White Night Light	B, C-7A		2⅛	3000		14	2.7	$0.48	
			41542-2	▲†	BC4C7/4	120	48	Clear Night Light	B, C-7A		2⅛	3000		16	2.7	$0.48	
	T5	Wedge	41605-7	†	BC4T5/G/TP	12	24	Transparent Green Landscape	B, C-2R		1½	300			0.3	$0.48	
			41607-3	†	BC4T5/A/TP	12	24	Transparent Amber Landscape	B, C-2R		1½	300			0.3	$0.48	
			41604-0	†	BC4T5/R/TP	12	24	Transparent Red Landscape	B, C-2R		1½	300			0.3	$0.48	
			41606-5	†	BC4T5/B/TP	12	24	Transparent Blue Landscape	B, C-2R		1½	300			0.3	$0.48	
6	S6	Cand.	24835-1		6S6	120-130	48	Clear Indicator	B, C-7A		1⅞	1500		39	1.4	$0.72	
			41609-9	▲†	BC6S6	12	24	Clear Indicator Light	B, C-2V		2	1500		50	1.4	$0.72	
			41669-3	▲†	BC6S6	120	24	Clear Indicator Light	B, C-7A		2	1500		40	1.4	$0.72	
7	C7	Cand.	37378-7	▲	7C7	120-130	24	Clear Indicator	B, C-7A		2⅛	3000		45	2.7	$0.84	
			25714-7	▲ *	BC7C7/W 12/2	120	24	White Night Light	B, C-7A		2⅛	3000		35	2.7	$0.84	
			41546-3	▲†	BC7C7/4	120	96	Clear Night Light	B, C-7A		2⅛	3000		45	2.7	$0.84	
			41547-1	▲†	BC7C7/W	120	48	White Night Light	B, C-7A		2⅛	3000		35	2.7	$0.84	
7.5	S11	Med.	41544-8	▲†	BC7-1/2S11	120-130	12	Clear Night Light	B, C-7A		2¼	1400		45	1.3	$0.90	
			41545-5	▲†	BC7-1/2S11	120	6	White Night Light	B, C-7A		2¼	1400		35	1.3	$0.90	
10	S11	Inter.	41529-9	▲†	BC10S11N	120	12	Clear Appliance	B, C-7A/ CC-2V		3	1500			1.4	$1.20	
11	S8	S.C. Bay	41665-1	†	BC11S8/SC/TP	12	24	Clear Landscape	B, C-2R		2	700		180	0.6	$1.32	
	S14	Med.	41672-7	†	BC11S14/F 130V 6/1PK	130	6		B, C-9		3½	3000		70	2.7	$1.32	
			41664-4	†	BC11S14/CL 130V 6/1PK	130	6	Clear Sign	B, C-9		3½	3000		70	2.7	$1.32	
			13830-5		11S14 120/130V 24/1	120-130	24		B, C-9		3½	3000		75	2.7	$1.32	
13	S8	S.C. Bay	41671-9	† *	BC93 12V 12/2	12	24	Clear Miniature	B, C-6		2	700			0.6	$1.57	
15	A15	Med.	14587-0	▲	15A15/CL	120-130	60	Clear	B, C-9	2⅜	3½	2500		110	2.3	$1.81	
			16860-9	▲	15A/WL 12/2	120	24	Soft White Long Life	B, C-9		3½	3000		115	2.7	$1.81	
	T6	Cand.	23582-0	▲	15T6	120	24	Clear Switchboard	B, C-7A		3⅛	2000		110	1.8	$1.81	
			24815-3	(63)▲	15T6	140-150	24	Clear Switchboard	B, C-7A		3⅛	2000		100	1.8	$1.81	
			41610-7	(63)▲†	BC15T6	140-150	24	Exit Sign	B, C-7A		3	2000		100	1.8	$1.81	
			41611-5	▲†	BC15T6C/TP	120	12	Clear Showcase	B, C-7A		3	1500		110	1.4	$1.81	
	T7	Cand.	41612-3	(4)†	BC15T7C	120	6	Clear Showcase	B, C-7A		2¼	1000		110	0.9	$1.81	
		Inter.	41613-1	(4)▲†	BC15T7N 120V	120	6	Clear Appliance	B, C-7A		2¼	1000		100	0.9	$1.81	
	T10	Med.	41584-4	▲†	BC15T10 6/1	120	6	Clear Showcase	B, C-9		5⅝	2500		120			
20	T6½	Inter.	24853-4		20T6½IF	120	24	Frost Exit Sign	B, C-8		5½	5000		150	4.6	$2.41	
			41626-3	†	BC20T6½N/CL	120	6	Clear Exist Sign	B, C-8		5½	3000		160	2.7	$2.41	

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Incandescent Lamps by Wattage (Continued)

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	FTC REQUIREMENTS¥ Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
25	A15	Med.	41533-1	▲†	BC25A15/IF 12/1	120	12	Frost Appliance	B, C-9		3½	1000		210	0.9	$3.01	
	A19	Med.	14421-2	▲	25A/TG 6/1	120	6	Transparent Green	B, C-9		3 15/16	3000			2.7	$3.01	
			14422-0	▲	25A/TR 6/1	120	6	Transparent Red	B, C-9		3 15/16	3000			2.7	$3.01	
			14423-8	▲	25A/TY 6/1	120	6	Transparent Yellow	B, C-9		3 15/16	3000			2.7	$3.01	
			14420-4	▲	25A/TB 6/1	120	6	Transparent Blue	B, C-9		3 15/16	3000			2.7	$3.01	
			37386-0	▲	25A/RS	120-130	120	Frost Rough Service	R, C-9		3 15/16	1000		235	0.9	$3.01	
	R14	Inter.	24828-6	■	R14N	120	24	Mini Refl. Lt. Fr. Actual Bulb Dia. 1¾"	C, CC-2V		2⅜	1500		200	1.4	$3.01	2800
			41537-2	■†	BC25R14N	120	6	Mini Refl. Lt. Fr.	C, CC-2V		3½	1500		150	1.4	$3.01	2800
	S11	Inter.	41670-1	†	BC25S11N	120	12	Clear Appliance	B, C-7A		2	500		220	0.5	$3.01	
	T6½	Inter.	41628-9	†	BC25T6½	120-130	6	Clear Appliance	B, C-8		6	1000		220	0.9	$3.01	
	T7	Inter.	41627-1	†	BC25T7N	120	6	Clear Appliance	B, C-7A		2¼	1000		200	0.9	$3.01	
	T10	Med.	13812-3	▲	25T10/IF 24/1	120-130	24	Frost Showcase	B, C-8		5⅜	1000		255	0.9	$3.01	
			41585-1	▲†	BC25T10/TP 6/1	120	6	Clear Showcase	B, C-8		5⅜	1000		250	0.9	$3.01	
			13813-1	▲	25T10 24/1	120-130	24	Clear Showcase	B, C-8		5⅜	1000		260	0.9	$3.01	
30	R20	Med.	22078-0	(87)▲	30R20 12/1	130	12	Lt. Frost Reflector	C, CC-6		3⅝	2000		205	1.8	$3.61	
			16753-6	(87)▲	30R20/LL 12/1	120	12	Frost Long Life Reflector	C, CC-6		3⅝	2500	335	205	2.3	$3.61	
30	A21	3 Ct. Med.	36662-5	(8)▲	30/100A/W 12/1	120	12	Soft White 3-Way	C, 2CC-8		5⅞	1200		265	1.1	$8.43	2570
70														820		$12.05	2680
100														1090		$4.10	2650

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Incandescent Lamps

Incandescent Lamps by Wattage (Continued)

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
														FTC REQUIREMENTS¥			
40	A15	Med.	29999-0	▲	BC40A15/CL/LL	120	12	Clear Long Life Appliance	C, C-9		3½	1750		400	1.6	$4.82	
			41676-8	▲†	BC40A15/LL	120	60	Clear Long Life Appliance	C, C-9		3½	1750		400	1.6	$4.82	
			16934-2	▲	BC40A15/FAN/CL/LL 6/2	120	12	Clear Long Life Fan	C, C-9		3½	2000		395	1.8	$4.82	
			16935-9	▲	BC40A15/FAN/W/LL 6/2	120	12	White Long Life Fan	C, C-9		3½	2000		365	1.8	$4.82	
			13565-7	▲	BC40A15/FAN/NTL 6/2	120	12	Natural Light Fan	C, C-9		3½	1500		340	1.4	$4.82	
	A19	Med. ++	27081-9	▲	40A 12/4	120	48	Frost	C, CC-6		4⅞	1500		455	1.4	$4.82	2660
			16797-2	▲	40A/CL/LL 12/2	120	24	Clear Long Life	C, CC-6		4⅞	1500		460	1.4	$4.82	2670
			16737-9	▲	40A/WL 24/4	120	96	Soft White Long Life	C, CC-6		4⅞	1500		465	1.4	$4.82	2650
			16869-0	▲	40A/WL 12/4	120	48	Soft White Long Life	C, CC-6		4⅞	1500		450	1.4	$4.82	2690
			13558-2	▲	40A/NTL 12/4	120	48	Natural Light Standard	C, CC-6		4⅞	1000		370	0.9	$4.82	2980
			37465-2	▲	40A	120	48	Frost	C, CC-6		4⅞	1500		455	1.4	$4.82	2660
			37466-0	▲	40A	130	48	Frost	C, CC-6		4⅞	1500		495	1.4	$4.82	2630
								Ratings @ 120V = 34W				3000		370	2.7	$4.22	2720
			37399-3	▲	40A/CL	120-130	48	Clear, Ratings @ 130V = 43W	C, CC-6	3⅛	4⅞	750		500	1.4	$4.82	2670
								Ratings @ 120V = 38W				1500		435	2.3	$4.46	2750
	R14	Inter.	41539-8	†	BC40R14N 6/1	120	6	Light Fr. Mini. Refl.	C, CC-2V		2⅝	1500		250	1.4	$4.82	
		Med.	41538-0	†	BC-40R14/SP	120	6	Surge Proof Light Mini. Refl.	C, CC-2V		2⅝	1500		250	1.4	$4.82	
	R16	Med.	41540-6	†	BC40R16/SP 6/1	120	6	Surge Proof Light Mini. Refl.	C, CC-2V		3⅜	1500		250	1.4	$4.82	
	S11	Inter.	41541-4	▲†	BC40S11/N TP 16/1	120	16	Clear High Intensity	C, CC-2V		2¼	500		440	0.5	$4.82	
	T6½	Inter.	41629-7	†	BC40T6-1/2	120	6	Clear Appliance	B, C-8		5½	1000		350	0.9	$4.82	
	T8	Inter.	41625-5	†	BC40T8N	130	6	Clear Appliance	C, C-7A		2¾	1000		400	0.9	$4.82	
	T10	Med.	41673-5	▲†	BC40T10/IF/TP 6/1	120	6	Frost Showcase	B, C-8		5⅝	1000		250	0.9	$4.82	
			13814-9	▲	40T10/IF 24/1	120-130	24	Frost Showcase	B, C-8		5⅝	1000		435	0.9	$4.82	
			41586-9	▲†	BC40T10/TP 6/1	120	6	Clear Showcase	B, C-8		5⅝	1000		435	0.9	$4.82	
			13815-6	▲	40T10 24/1	120-130	24	Clear Showcase	B, C-8		5⅝	1000		440	0.9	$4.82	
	BR30	Med.	16751-0	(87)▲	45BR30/FL55/LL 12/1	120	12	Long Life Reflector Flood	C, CC-6		5⅜	2500		330	2.3	$5.42	2600
	R20	Med.	20323-2	(87)▲	45R20/LL 12/1	120	12	Long Life Reflector Flood	C, CC-6		3⅛	2500		385	2.3	$5.42	
			20322-4	(87)▲	45R20 12/1	130	12	Reflector Flood	C, CC-6		3⅛	2000		380	1.8	$5.42	
			22314-9	†	45R20/LL 120V 4/3 TP	120	4	Long Life Reflector Flood	C, CC-6		3⅛	2500		385	2.3	$5.42	
			22311-5	†	45R20 120V 1/12	120	12	Reflector Flood	C, CC-6		3⅛	2000		380	1.8	$5.42	
50	A19	Med.	21952-7	▲	50A19/31	120	120	Clear Commercial Oven	B, C-9	2½	3⅛	1000		500	0.9	$6.02	
			37403-3	▲	50A/RS	120-130	120	Frost Rough Service	B, RC-9		3⅛	1000		500	0.9	$6.02	
			43256-1	†	50A 24V 6/1PK TP	24	6	Marine	C, C-6		4¼	1000		825	0.9	$6.02	
			41526-5	†	50A/RV	12	6	Marine	C, C-6		4¼	1000		875	0.9	$6.02	
			24572-0	▲	50A/RS	250	120	Frost Rough Service	C, RC-9		3⅛	1000		355	0.9	$6.02	
			14977-3	(66)▲	50A/RS/TF	120-130	120	Frost Rough Service Silicone Coated	B, C-17A		3⅛	1000			0.9	$6.02	
	ER30	Med.	14355-2	(87)▲	50ER30	120-130	24	Elliptical Reflector	C, CC-6		6⅜	2000		430	1.8	$6.02	2710

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Incandescent Lamps by Wattage (Continued)

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
														FTC REQUIREMENTS¥			
50	R20	Med.	41531-5	(19,87)▲†	50R20/Agro 12/1	120	12	Agro-Lite Plant Light	C, CC-6		3 15/16	2000			1.8	$6.02	
50	A21	3 Ct. Med.	13564-0	(8)▲	50/150A/NTL 12/1	120	12	Natural Light Reflector	C,2CC-6		5 5/16	1200		395	1.1	$6.02	2590
100														1115		$12.05	3100
150														1510		$18.07	3050
			16948-2	(8)▲	50/150A/WL 12/1	120	12	Soft White Long Life 3-Way	C, 2CC-8		5 5/16	1750		460	1.6	$6.02	2720
														1165		$12.05	2810
														1660		$18.07	2780
			32359-2	(8) ☐▲	50/150A/DL 12/1	120	12	Director 3-Way	C, 2CC-8		5 5/16	1200		520	1.1	$6.02	2670
														1320		$12.05	2780
														1840		$18.07	2740
52	A19	Med.	22237-2	▲✔	60A-52A/EW	120	48	Frost Econ-o-watt	C, CC-6		4 7/16	1000		700	0.9	$6.26	2760
			14999-6	▲	60A-52A/99/EW	120-130	48	Frost Econ-o-watt Ext. Service Ratings @ 130V = 60W	C, CC-6		4 7/16	2000 1000		650 855	0.9	$6.26 $7.23	2700 2780
60	A15	Med.	16945-8	▲	BC60A15/FAN/W/ LL 6/2	120	12	White Long Life Fan	C, C-9		3 1/2	2000		570	1.8	$7.23	
			16946-6	▲	BC60A15/FAN/CL/LL 6/2	120	12	Clear Long Life Fan	C, C-9		3 1/2	2000		630	1.8	$7.23	
	A19	Med. ++	16794-0	▲	60A/CL/LL 12/2	120	24	Clear Long Life	C, CC-6		4 7/16	1500		865	1.4	$7.23	2760
			16874-0	▲	60A/WL 12/4	120	48	Soft White Long Life	C, CC-6		4 7/16	1500		830	1.4	$7.23	2750
		Med.	13559-0	▲	60A/NTL 12/4	120	48	Natural Light Standard	C, CC-6		4 7/16	1000		640	0.9	$7.23	2790
		Med. ++	27082-7	▲✔	60A 12/4	120	48	Frost	C, CC-6		4 7/16	1000		890	0.9	$7.23	2760
			37469-4	▲✔	60A	120	48	Frost	C, CC-6		4 7/16	1000		840	0.9	$7.23	2790
			37471-0	▲✔	60A	130	48	Frost	C, CC-6		4 7/16	1000		855	0.9	$7.23	2780
								Ratings @ 120V =51W				2000		650	1.8	$6.14	2700
		Med.	14979-9	(66)▲	60A/TF	120	120	Frost Silicone Coated	C, CC-6		4 7/16	1000			0.9	$7.23	
		Med. ++	22246-3	▲✔	60A/99	130	48	Frost Extended Service	C, CC-6		4 7/16	2500		720	2.3	$7.23	2670
								Ratings @ 120V =51W				5000		540	4.6	$6.14	2590
			37522-0	▲	60A/CL	130	48	Clear	C, CC-6	3 1/8	4 7/16	500		965	0.5	$7.23	2820
								Ratings @ 120V =51W				1000		730	0.9	$6.14	2740
		Med.	41534-9	▲†	60A/AGRO 12/1	120	12	Agro-Lite Plant Light	C, C-9		4 7/16	1000			0.9	$7.23	
			41543-0	▲†	BC60A/CL/GDO 6/2	120	6	Garage Door Opener	C,C-9		4 7/16	3500		630	3.2	$7.23	
		Med. ++	37483-5	▲✔	60A/W 12/4	120	48	Soft White	C, CC-6		4 7/16	1000		860	0.9	$7.23	2770
			37484-3	▲	60A/W/TP 24/4	120	96	Soft White Tray-Pak	C, CC-6		4 7/16	1000		860	0.9	$7.23	2770
			34822-7	☐▲	60A/STP/PK 12/2	120	24	Pink Softone Pastel	C, CC-6		4 3/16	1000		795	0.9	$7.23	2610
			41581-0	☐▲†✔	60A/YL 12/2	120	24	Bug-A-Way Yellow Longer Life	C, CC-6		4 7/16	1350			1.2	$7.23	
			22248-9	☐	60A19/35	130	48	Frost Industrial Service	C, C-9		4 7/16	1750		540	1.6	$7.23	2590
								Ratings @ 120V = 51W				3500		395	3.2	$6.14	2500
	T10	Med.	13811-5	▲	60T10/64IF 24/1	120	24	Frost	B, C-8		5 5/8	1000		515	0.9	$7.23	2630
			13810-7	▲	60T10/64 24/1	120	24	Clear	B, C-8		5 5/8	1000		520	0.9	$7.23	2620

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Incandescent Lamps

Incandescent Lamps by Wattage (Continued)

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
														FTC REQUIREMENTS*			
65	BR30	Med.	24876-5	(87)▲✔	65BR30/FL55 12/1	120	12	Reflector Flood	C, CC-6		5⅜	2000		620	1.8	$7.83	2710
			24884-9	(87)▲✔	65BR30/FL55	130	12	Reflector Flood	C, CC-6		5⅜	2000		605	1.8	$7.83	2780
			40886-4	†	65BR30 4 Pk 120V 36/4	120	36	Reflector Flood	C, CC-6		5⅜	2000		605	1.8	$7.83	
			20190-5	(87)▲	65BR30/FL55/TG 12/1	120	12	TuffGuard Coated Reflector Fl.	C, CC-6		5⅜	2000		635	1.8	$7.83	2710
			13785-1	(87)▲	65BR30/FL/NTL 12/1	120	12	Natural Light Reflector	C, CC-6		5⅜	2000		535	1.8	$7.83	2730
			14007-9	(87)	65BR30/FL 12/1 PRO	130	12	ProPack Reflector	C, CC-6		5⅜	2000		605	1.8	$7.83	2640
			29380-3		65BR30/FL55 SP 12/1	120	12	Surge Proof Reflector	C, CC-6		5⅜	3000		585	2.7	$7.83	2660
	BR40	Med.	22537-5	(87)▲	65BR/FL60	130	24	Reflector Flood	C, CC-6		6½	2000		565	1.8	$7.83	2710
			14008-7	(87)	65BR40/FL 12/1 PRO	130	12	ProPack Reflector	C, CC-6		6½	2000		565	1.8	$7.83	2710
			16741-1	(87)▲	65BR/FL60/LL 8/1	120	8	Long Life Reflector Flood	C, CC-6		6½	2500	500	625	2.3	$7.83	2740
			38913-0	(87)▲	65BR/FL60 24/1	120	24	Long Life Reflector Flood	C, CC-6		6½	2000	500	620	1.8	$7.83	2710
75	A19	Med.	41532-3	▲†	75A/BLB	120	6	Black Light	C-9		4¼	1000			0.9	$9.03	
			29360-5	▲	75A/RS/VS	120-130	12	Frost Rough & Vib. Svc. Ratings @ 120V =70W	R, C-9	2½	3 15/16	1000 1700		712 660	0.9 1.6	$9.03 $8.43	
	A21	Med.	41527-3	(66)▲†	75A/RH/TF 12/1	120-130	12	Frost Silicone Coated Tough Bulb	C, RC-9		5 5/16	1000		1000	0.9	$9.03	2800
			20470-1	▲	75A/RH 12/1	120-130	12	Frost Rough House Ratings @ 120V =70W	C, RC-9		5 5/16	1000 1700		750 730	0.9 1.6	$9.03 $8.43	
	BR30	Med.	24903-7	(66,87)▲	75BR30/FL/TF	120	12	Frost Silicone Coated Reflector	C, CC-6		5 5/16	2000			1.8	$9.03	
			41528-1	(87)▲†	75BR30/AGRO 6/1	120	6	Agro-Lite Plant Light	C, CC-6		5⅜	2000		700	1.8	$9.03	
			24902-9	(87)▲	75BR30/PK 8/1	120	8	Pink	C, CC-6		5⅜	2000		555	1.8	$9.03	2120
100	A21	Med.	14981-5	(66)▲	100A21/TF	120	120	Frost Silicone Coated	C, CC-8		5 5/16	750			0.7	$12.05	
			24661-1	▲	100A	277	120	Frost Mine	C, C-9		5 5/16	1000		1070	0.9	$12.05	
			14400-6	(43, 64)▲	100A/1SBIF	120	120	Frost Silvered Bowl	C, C-9		5 5/16	1000		1150	0.9	$12.05	
			14971-6	(66)▲	100A/RS/TF	120-130	60	Frost Silicone Coated Rough Service	C, RC-9		5 5/16	1000			0.9	$12.05	
			27550-3	▲	100A/RS	250	60	Frost Rough Service	C, RC-9		5 5/16	1000		1030	0.9	$12.05	
			15927-7		100A/RS/VS/BR/TG	120-130	60	TuffGuard Frost Rough & Vibration Svc. Ratings @ 120V =94W	C, RC-9		5 5/16	1000 1700		1230 945	0.9 1.6	$12.05 $11.32	
	BR38	Med.	38532-8	(29, 82)	100PAR/1/B 6/1	120	6	Blue BR38	C, CC-6		5 5/16	2000			1.8	$12.05	
			38530-2	(29, 82)	100PAR/1/G 6/1	120	6	Green BR38	C, CC-6		5 5/16	2000			1.8	$12.05	
			38529-4	(29, 82)	100PAR/1R 6/1	120	6	Red BR38	C, CC-6		5 5/16	2000			1.8	$12.05	
			38766-2	(29, 82)	100PAR/1/Y 6/1	120	6	Yellow BR38	C, CC-6		5 5/16	2000			1.8	$12.05	
	PAR38	Med. Skt.	14550-8	(29, 82)	100PAR38/HEAT/CL	120	12	Clear PAR Infrared	C, C-9		5 5/16	5000			4.6	$12.05	
100	PS25	3 Ct. Mog.	36734-2	(8)▲	100/300/W 12/1	120	12	Soft White 3-Way	C, 2CC-6		6 13/16	1200		1320	1.1	$12.05	
200														3300		$24.09	
300														4620		$36.14	

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Incandescent Lamps by Wattage (Continued)

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
														FTC REQUIREMENTS*			
116	A21	Med.+	22483-2	(12)	116A21/TS	120	120	Traffic Signal Clear	C, C-9	2 7/16	4 7/16	8000		1180	7.3	$13.97	
			22485-7	(12)	116A21/TS	130	120	Traffic Signal Clear	C, C-9	2 7/16	4 7/16	8000		1180	7.3	$13.97	
120	BR40	Med.	41530-7	(87)▲†	120BR/Agro 6/1	120	6	Agro-Lite Plant Light	C, CC-6		6½	2000			1.8	$14.45	
125	BR40	Med.	15930-1	(27,87,89) ▲	125BR40/1/TG 4/1	120	4	TuffGuard Coated Clear Reflector Infrared	C, C-9		6½	5000			4.6	$15.06	
			41675-0	(27,87,89) ▲†	125BR40/1	120	4	Clear Infrared	C, C-9		6½	5000			4.6	$15.06	
150	A21	Med.	27003-3	▲✔	150A	120	48	Frost	C, C-9		5 5/16	750		2620	0.7	$18.07	2840
			37418-1	(82)▲	150A/CL	120-130	60	Clear, Ratings @ 130V = 158W	C, CC-8	3⅞	5 5/16	750		2770	0.7	$18.07	2870
								Ratings @120V=139W				1275		2120	1.2	$16.74	2780
			14969-0	(66)▲	150A21/RS/TF	120-130	60	High-Temp. Coating	C, RC-9		5 5/16	1000			0.9	$18.07	
			27578-4	▲	150A21/RS/BR	120-130	60	Frost Rough & Vibration Service	C, RC-9		5 5/16	1000		2205	0.9	$18.07	
								Ratings @120V=141W				1700		1915	1.6	$16.98	
			43163-5	†	150/RS/TF 120-130V 8/1 PK	120-130	8	Frost Silicone Coated Tough Bulb	C, RC-9		5 5/16	1000		2205	0.9	$18.07	
			27588-3	▲	150A/35/RS/BR	120-130	60	Frost Industrial Rough Service	C, RC-9	3¾	5 15/16	3500		1640	3.2	$18.07	
								Ratings @120V=141W				5900		1425	5.4	$16.98	
	A25	Med.	14961-7	(14,66) ▢	150A25/35/TF	120	60	Frost Silicone Coated Ind. Svc.	C, C-9		6 15/16	3500			3.2	$18.07	
	BR38	Med.	38568-2		150BR38/5FL	130	12	Flood Anti-Vibration	C, C-11V		5½	5000		965	4.6	$18.07	2550
175	PAR38	Med. Skt.	14551-6	(27,89)	175PAR38/HEAT/CL	120	12	Clear Infrared	C, C-9		5 5/16	5000			4.6	$21.08	
200	A21	Med.	16867-4	▲	200A/WL 6/1	120	6	Soft White Long Life	C, CC-2V		5 5/16	1500		3100	1.4	$24.09	
	A23	Med.	16798-0	▲	200A/CL/LL 6/1	120	6	Clear Long Life	C, CC-8		6 5/16	1500		3400	1.4	$24.09	
			36289-7	▲	200A	120	60	Frost	C, CC-8		6 5/16	750		3800	0.7	$24.09	
			36291-3	▲	200A	130	60	Frost	C, CC-2V		6 5/16	750		3600	0.7	$24.09	
								Ratings @120V=176W				2120		2700	1.9	$21.20	
			37427-2	▲	200A/CL	120-130	60	Clear	C, CC-2V	4⅝	6 5/16	750		3600	0.7	$24.09	
			28176-6	▲	200A/99	120-130	60	Frost Extended Service	C, CC-2V		6 5/16	2500		3250	2.3	$24.09	
								Ratings @120V=187W				4250		2830	3.9	$22.52	
	PS30	Med.	14298-3	(66)▲	200/TF	120-130	60	Frost Silicone Coated	C, C-9		8 1/16	750		2980	0.7	$24.09	
			14304-0	▲	200PS30/23	120-130	60	Frost	C, C-9		8 1/16	1000		2800	0.9	$24.09	
								Ratings @120V=177W				2830		2130	2.6	$21.32	
			14305-7	(66)▲	200PS30/RS/TF	120-130	60	Frost Rough Service Silicone Coated	C, C-9		8 1/16	1000		2715	0.9	$24.09	
												2830		2065			
			14302-4	▲	200PS30/RS	250	60	Clear Rough Service	C, C-9		8 1/16	1000		2600	0.9	$24.09	
			14300-8		200/35/TF	120	60	Frost Silicone Coated Ind. Svc.	C, C-9		8 1/16	3500		2570	3.2	$24.09	

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Incandescent symbols and footnotes located on page 132



Incandescent Lamps

Incandescent Lamps by Wattage (Continued)

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
															FTC REQUIREMENTS*		
250	BR40	Med.	41674-3	(27, 87)▲†	250BR40/1 4/1	120	4	Clear Reflector Infrared	C, C-9		6½	5000			4.6	$30.11	
			20205-1	(27, 87)▲	250BR40/1/TG 4/1	120	4	TuffGuard Coated Clr. Ref. Infrared	C, C-9		6½	5000			4.6	$30.11	
	PAR38	Med. Skt.	37432-2	(53, 82)⛉	K250PAR38/FL	120-130	12	PAR Floodlight (Krypton)	C, CC-6		5⁵⁄₁₆	4000	5000	3100	3.7	$30.11	
	R40	Med.	41583-6	(27,87,89)▲†	250R40/HR 4/1	120	4	Red Bowl Heat Ray	C, C-9		6⅞	5000			4.6	$30.11	
			15932-7	(27,87,89)▲	250R40/HR/TG 4/1	120	4	TuffGuard Ctd. Red Bowl Heat Ray	C, C-9		6⅞	5000			4.6	$30.11	
300	BR40	Med.	14343-8	(87)▲	300BR/FL 130	120-130	24	Reflector Flood	C, CC-11		6½	2000		2480	1.8	$36.14	
	PS25	Med.	28177-4	▲	300M/IF	120-130	60	Frost Ratings @120V=282W	C, CC-8		6¹⁵⁄₁₆	750 1280		6230 5471	0.7 1.2	$36.14 $33.97	
			38941-1	▲	300M/IF	120	6	Frost	C, CC-8		6¹⁵⁄₁₆	750		6300	0.7	$36.14	
			13391-8	▲	300M	120-130	12	Clear Ratings @120V=265W	C, CC-8	5¼	6¹⁵⁄₁₆	750 2120		6280 4625	0.7 1.9	$36.14 $31.92	
			35009-0	▲	300M/99IF	130	60	Frost Extended Service Ratings @120V=265W	C, CC-8		6¹⁵⁄₁₆	2500 7130		506 4044	2.3 6.5	$36.14 $31.92	
	PS30	Med.	14307-3	▲	300M/PS30IF	120-130	60	Frost Ratings @120V=265W	C, C-9		8⅛	750 2120		5000 3800	0.7 1.9	$36.14 $31.92	
	PS35	Mog.	14309-9		300/99IF	120-130	24	Frost Extended Service Ratings @120V=265W	C, C-9		9⅜	1000 2830		4500 3420	0.9 2.6	$36.14 $31.92	
			14321-4		300/99	120-130	24	Clear Extended Service Ratings @120V=265W	C, C-9		9⅜	2500 7134		4600 3495	2.3 6.5	$36.14 $31.92	
			14316-4		300/IF	120-130	12	Frost Ratings @120V=265W	C, C-9		9⅜	1000 2854		4600 3495	0.9 2.6	$36.14 $31.92	
			14314-9		300	120-130	24	Clear Ratings @120V=265W	C, C-9	7	9⅜	1000 2854		4600 3495	0.9 2.6	$36.14 $31.92	
	R40	Med.	14432-9	■	300R/FL/1	12	24	Reflector Flood Frost	C, C-2V		6¾	2000		2960	1.8	$36.14	
		Mog.	14433-7	(31,37,51, 53)▲	300R/3FL	120-130	24	Reflector Flood	CC-11		7¼	2000		3600	1.8	$36.14	
500	PS35	Mog.	14407-1		500	120-130	24	Clear Ratings @120V=442W	C, C-9	7	9⅜	1000 2830		8900 6755	0.9 2.6	$60.23 $53.24	
			14313-1		500/IF	120-130	24	Frost Ratings @120V=442W	C, C-9		9⅜	1000 2830		8700 6600	0.9 2.6	$60.23 $53.24	
	R40	Med.	14430-3	(31,37,51, 53)■	500R/3FL/2S	130	24	Swimming Pool Ratings @120V=442W	C, C-7A		6¾	2000 5707		6120 4669	1.8 5.2	$60.23 $53.24	
		Mog.	14434-5	(51,53)	500R/3FL	120-130	24	Frost Reflector Flood	CC-11		7¼	2000		5000	1.8	$60.23	
			14435-2	(51,53)	500R/3FL	250	24	Frost Reflector Fl. Special Svc.	C, C-7A		7¼	2000		4700	1.8	$60.23	

For the most current product information, go to the e-catalog on **www.philips.com**
Incandescent symbols and footnotes located on page 132



Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
Incandescent Lamps by Wattage (Continued)														FTC REQUIREMENTS¥			
620	PS40	Mog. Pf.	14323-0		620PS40P	120	24	Code Beacon	C, C-7A	5 1⁄16	10 1⁄16	3000		9000	2.7	$74.68	
Decoratives, Blister-Carded (12)																	
15	F10	Cand.	16830-2	▲	BC15F10C/CL/LL 6/2	120	12	Clear Long Life Flame	B, C-7A		3 1⁄16	2000		95	1.8	$1.81	2450
	BA9	Cand.	16811-2	▲	BC15BA9C/CL/LL 6/2	120	12	Clear Long Life Bent Tip	B, CC-2V, C-7A		4 3⁄16	2000		110	1.8	$1.81	
25	BA9	Cand.	16719-7	▲	BC25BA9C/CL/LL 6/4	120	24	Clear Long Life Bent Tip	C, CC-2V, C-7A		4 3⁄16	2000		150	1.8	$3.01	
			16806-2	▲	BC25BA9C/CL/LL 6/2	120	12	Clear Long Life Bent Tip	C, CC-2V, C-7A		4 3⁄16	2000		150	1.8	$3.01	
			16810-4	▲	BC25BA9C/F/LL 6/2	120	12	Frost Long Life Bent Tip	C, CC-2V, C-7A		4 3⁄16	2000		145	1.8	$3.01	
			13823-0	▲	BC25BA9C/CL 6/1 TP	120	6	Clear Bent Tip	C, CC-2V, C-7A		4 3⁄16	2000			1.8	$3.01	
	BA9½	Med.	16819-5	▲	BC25BA9½/CL/LL 6/2	120	12	Clear Long Life Bent Tip	C, CC-2V, C-7A		4 1⁄16	2000		150	1.8	$3.01	
	B10½	Cand.	16824-5	▲	BC25B10½C/CL/LL 6/2	120	12	Clear Long Life Blunt Tip	C, CC-2V, C-7A		4 1⁄16	2000		150	1.8	$3.01	
	CA8	Cand.	13568-1	▲	BC25CA8C/CL/LL 6/2	120	12	Clear Petite Long Life Bent Tip	C, CC-2V		3½	2000		220	1.8	$3.01	2550
	F10	Cand.	16832-8	▲	BC25F10C/CL/LL 6/2	120	12	Clear Long Life Flame	B, C-7A		3 1⁄16	2000		105	1.8	$3.01	2500
	F15	Med.	16833-6	▲	BC25F15/CL/LL 6/2	120	12	Clear Long Life Flame	B, C-9		4½	2000		150	1.8	$3.01	
			16839-3	▲	BC25F15/IR/LL 6/2	120	12	Iridescent Long Life Flame	C, C-9		4½	2000		150	1.8	$3.01	
	G16½	Cand.	16845-0	▲	BC25G16½C/CL/LL 6/2	120	12	Clear Long Life Globe	B, C-7A		3	2000		200	1.8	$3.01	2500
			16847-6	▲	BC25G16½C/W/LL 6/2	120	12	White Long Life Globe	B, C-7A		3	2000		165	1.8	$3.01	2500
		Med.	13535-0	▲	BC25G16½/CL/LL 6/2	120	12	Clear Long Life Globe	C, CC-2V		2¾	2000		180	1.8	$3.01	2500
			13534-3	▲	BC25G16½/W/LL 6/2	120	12	White Long Life Globe	C, CC-2V		2¾	2000		160	1.8	$3.01	2400
40	BA9	Cand.	16720-5	▲	BC40BA9C/CL/LL 6/4	120	24	Clear Long Life Bent Tip	C, CC-2V, C-7A		4 3⁄16	2000		300	1.8	$4.82	
			16807-0	▲	BC40BA9C/CL/LL 6/2	120	12	Clear Long Life Bent Tip	C, CC-2V, C-7A		4 3⁄16	2000		300	1.8	$4.82	
			16809-6	▲	BC40BA9C/F/LL 6/2	120	12	Frost Long Life Bent Tip	C, CC-2V, C-7A		4 3⁄16	2000		295	1.8	$4.82	
	BA9½	Med.	16760-1	▲	BC40BA9½/CL/LL 6/4	120	24	Clear Long Life Bent Tip	C, CC-2V, C-7A		4 1⁄16	2000		300	1.8	$4.82	
			16820-3	▲	BC40BA9½/CL/LL	120	12	Clear Long Life Bent Tip	C, CC-2V, C-7A		4 1⁄16	2000		300	1.8	$4.82	
	B10½	Cand.	16825-2	▲	BC40B10½C/CL/LL 6/2	120	12	Clear Long Life Blunt Tip	C, CC-2V		4 1⁄16	2000		300	1.8	$4.82	
			14125-9	▲	BC40B10½C/NTL 6/2	120	12	Natural Light Blunt Tip	C, CC-2V, C-7A		4 1⁄16	2000		270	1.8	$4.82	

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Incandescent symbols and footnotes located on page 132



Incandescent Lamps

Decoratives

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[1]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
Decoratives, Blister-Carded (Continued) (12)														FTC REQUIREMENTS¥			
40	B13	Med.	16828-6	▲	BC40B13/CL/LL 6/2	120	12	Clear Long Life Blunt Tip	C, C-7A		4 1/16	2000		300	1.8	$4.82	
			14127-5	▲	BC40B13/NTL 6/2	120	12	Natural Light Blunt Tip	C, CC-2V, C-7A		4 1/16	2000		270	1.8	$4.82	
	F15	Med.	16835-1	▲	BC40F15/CL/LL 6/2	120	12	Clear Long Life Flame	C, C-9		4 1/2	2000		385	1.8	$4.82	
			16837-7	▲	BC40F15/IR/LL 6/2	120	12	Iridescent Long Life Flame	C, C-9		4 1/2	2000		370	1.8	$4.82	
			16838-5	▲	BC40F15/W/LL 6/2	120	12	White Long Life Flame	C, C-9		4 1/2	2000		300	1.8	$4.82	
	G16 1/2	Cand.	16846-8	▲	BC40G16 1/2C/CL/LL 6/2	120	12	Clear Long Life Globe	C, CC-2V, C-7A		3	2000		300	1.8	$4.82	2550
			16848-4	▲	BC40G16 1/2C/W/LL 6/2	120	12	White Long Life Globe	C, CC-2V, C-7A		3	2000		245	1.8	$4.82	2550
		Med.	13537-6	▲	BC40G16 1/2/CL/LL 6/2	120	12	Clear Long Life Globe	C, CC-2V, C-7A		2 3/4	2000		300	1.8	$4.82	2550
			13536-8	▲	BC40G16 1/2/W/LL 6/2	120	12	White Long Life Globe	C, CC-2V, C-7A		2 3/4	2000		270	1.8	$4.82	2550
60	BA9	Cand.	16808-8	▲	BC60BA9C/CL/ 6/2	120	12	Clear Long Life Bent Tip	C, CC-2V, C-7A		4 3/16	2000		550	1.8	$7.23	
			16721-3	▲	BC60BA9C/CL/LL 6/4	120	24	Clear Long Life Bent Tip	C, CC-2V, C-7A		4 3/16	2000		550	1.8	$7.23	
			16805-4	▲	BC60BA9C/F/LL 6/2	120	12	Frost Long Life Bent Tip	C, CC-2V, C-7A		4 3/16	2000		545	1.8	$7.23	
	BA9 1/2	Med.	16822-9	▲	BC60BA9 1/2/CL/LL 6/2	120	12	Clear Long Life Bent Tip	C, CC-2V, C-7A		4 1/16	2000		505	1.8	$7.23	2590
	B10 1/2	Cand.	16826-0	▲	BC60B10 1/2C/CL/LL 6/2	120	12	Clear Long Life Blunt Tip	C, CC-2V		4 1/16	2000		550	1.8	$7.23	
	F15	Med.	16842-7	▲	BC60F15/CL/LL 6/2	120	12	Clear Long Life Flame	C, C-9		4 1/2	2000		660	1.8	$7.23	2700
	G16 1/2	Cand.	16699-0	▲	BC60G16 1/2C/CL/LL 6/2	120	12	Clear Long Life Globe	C, CC-2V		3	2000		540	1.8	$7.23	2700
Decoratives, Boxed (12)																	
40	BA9	Cand.	31093-8	▲	40BA9C/4M	120	25	Clear Bent Tip	C, C-7A, CC-2V		4 3/16	4000		270	3.7	$4.82	
60	BA9	Cand.	31095-3	▲	60BA9C/4M	120	25	Clear Bent Tip	C, C-7A, CC-2V		4 3/16	4000		530	3.7	$7.23	

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Incandescent symbols and footnotes located on page 132



Watts	Bulb	Base	Product Number	Symbols, Footnotes	Ordering Code	Volts	Pkg. Qty.‡	Description	Class Filament	LCL (In.)	MOL (In.)	Rated Avg. Life (Hrs.)(93)	Approx. MBCP[]	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
Decoratives, All Others														FTC REQUIREMENTS¥			
25	G25	Med.	16887-2	▲	25G25/CL/LL 12/1	120	12	Clear Long Life Globe	C, CC-6		4⅞	2000		235	1.8	$3.01	2500
			16748-6	▲	25G25/W/LL 12/1	120	12	White Long Life Globe	C, CC-6		4⅞	2000		210	1.8	$3.01	2600
			16901-1	▲	25G25/CL/LL 4/3	120	12	Clear Long Life Globe	C, CC-6		4⅞	2000		235	1.8	$3.01	
			16902-9	▲	25G25/W/LL 4/3	120	12	White Long Life Globe	C, CC-6		4⅞	2000		210	1.8	$3.01	
40	G25	Med.	16747-8	▲	40G25/CL/LL 12/1	120	12	Clear Long Life Globe	C, CC-6		4⅞	2000		460	1.8	$4.82	2550
			16746-0	▲	40G25/W/LL 12/1	120	12	White Long Life Globe	C, CC-6		4⅞	2000		415	1.8	$4.82	2600
			16903-7	▲	40G25/CL/LL 4/3	120	12	Clear Long Life Globe	C, CC-6		4⅞	2000		460	1.8	$4.82	2550
			16904-5	▲	40G25/W/LL 4/3	120	12	White Long Life Globe	C, CC-6		4⅞	2000		415	1.8	$4.82	2600
			13563-3	▲	40G25/NTL 6/1	120	12	Natural Light Globe	C, CC-6		4⅞	1500		320	1.4	$4.82	
	G40	Med.	16857-5	▲	40G40/CL/LL 6/1	120	6	Clear Long Life Globe	C, C-9		6⅝	3000		372	2.7	$4.82	
			16858-3	▲	40G40/W/LL 6/1	120	6	White Long Life Globe	C, C-9		6⅝	3000		335	2.7	$4.82	
60	G25	Med.	16896-2	▲	60G25/CL/LL 12/1	120	12	Clear Long Life Globe	C, CC-6		4⅞	2000		705	1.8	$7.23	2670
			16749-4	▲	60G25/W/LL 12/1	120	12	White Long Life Globe	C, CC-6		4⅞	2000		665	1.8	$7.23	2670
			16899-6	▲	60G25/CL/LL 4/3	120	12	Clear Long Life Globe	C, CC-6		4⅞	2000		705	1.8	$7.23	2670
			16900-3	▲	60G25W/LL 4/3	120	12	White Long Life Globe	C, CC-6		4⅞	2000		665	1.8	$7.23	2670
	G30	Med.	16849-2	▲	60G30/W/LL 6/1	120	6	White Long Life Globe	C, C-9		5½	3000		550	2.7	$7.23	2650
	G40	Med.	16851-8	▲	60G40/W/LL 6/1	120	6	White Long Life Globe	C, C-9		6⅝	3000		595	2.7	$7.23	2550
			16852-6	▲	60G40/CL/LL 6/1	120	6	Clear Long Life Globe	C, C-9		6⅝	3000		665	2.7	$7.23	2550
100	G40	Med.	16853-4	▲	100G40/W/LL 6/1	120	6	White Long Life Globe	C, C-9		6⅝	3000		985	2.7	$12.05	2550
189	PS-type	Med.	394239	▲	189PS25/64 125V 60PK	125		189PS25/64 125V 60PK	C, C-9		6⅜	3000			2.7	$22.77	2900

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Incandescent symbols and footnotes located on page 132



Incandescent Lamps

TuffGuard Incandescent Coated Lamps

Watts	Bulb	Base	Product Number	Symbols, Footnotes	Description	Volts	Pkg. Qty.‡	Rated Avg. Life (Hrs.)(93)	Availability	Lumens	Life Years (446)	Energy Cost (445)	Color Temp. (K)
TuffGuard Incandescent Coated Lamps											FTC REQUIREMENTS¥		
65	BR30	Med.	20190-5	(87) ▲ ✔	65BR30/FL55/TG 120V 12/1	120	12	2000	Made to Order		1.8	$7.83	
75	A19	Med.	15933-5	▲	75A/TG 130V 48/1	120	48	750	Stocked		0.7	$9.03	
			20192-1	▲	75A/RS/V/TG	120–130	12	1000	Stocked		0.9	$9.03	
	A21	Med.	15927-7		100A/RS/VS/BR/TG 120/130V 60/1	120	60	1000	Stocked		0.9	$12.05	
125	BR40	Med.	15930-1	(27,87,89)	125BR40/1/TG 120V 4/1	120	4	5000	Stocked		4.6	$15.06	
250	R40	Med.	15932-7	(27,87,89)	250R40/HR/TG 120V 4/1	120	4	5000	Stocked		4.6	$30.11	
	BR40	Med.	20205-1	(27,87)	250BR40/1/TG 120V 4/1	120	4	5000	Stocked		4.6	$30.11	

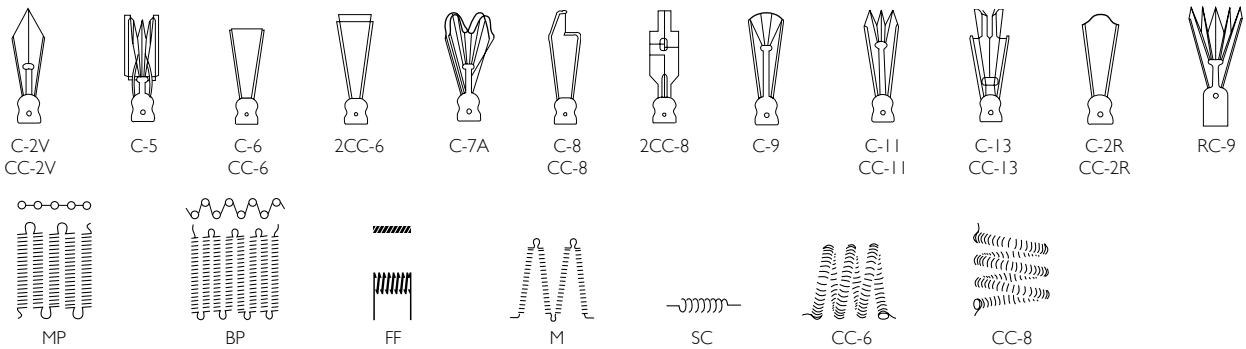
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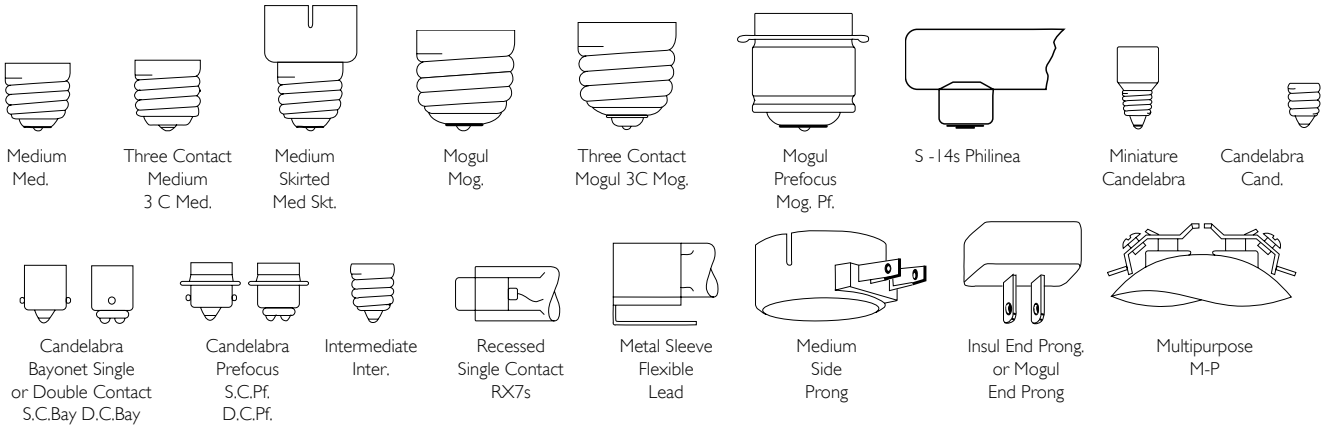


Filament Designations (Not Actual Sizes)

Filament designations consist of a letter or letters to indicate how the wire is coiled and an arbitrary number sometimes followed by a letter to indicate the arrangement of the filament on the supports. Prefix letters include C (coil)—wire is wound into a helical coil or it may be deeply fluted; CC (coiled coil)—wire is wound into a helical coil and this coiled wire again wound into a helical coil. Some of the more commonly used types of filament arrangements are illustrated.

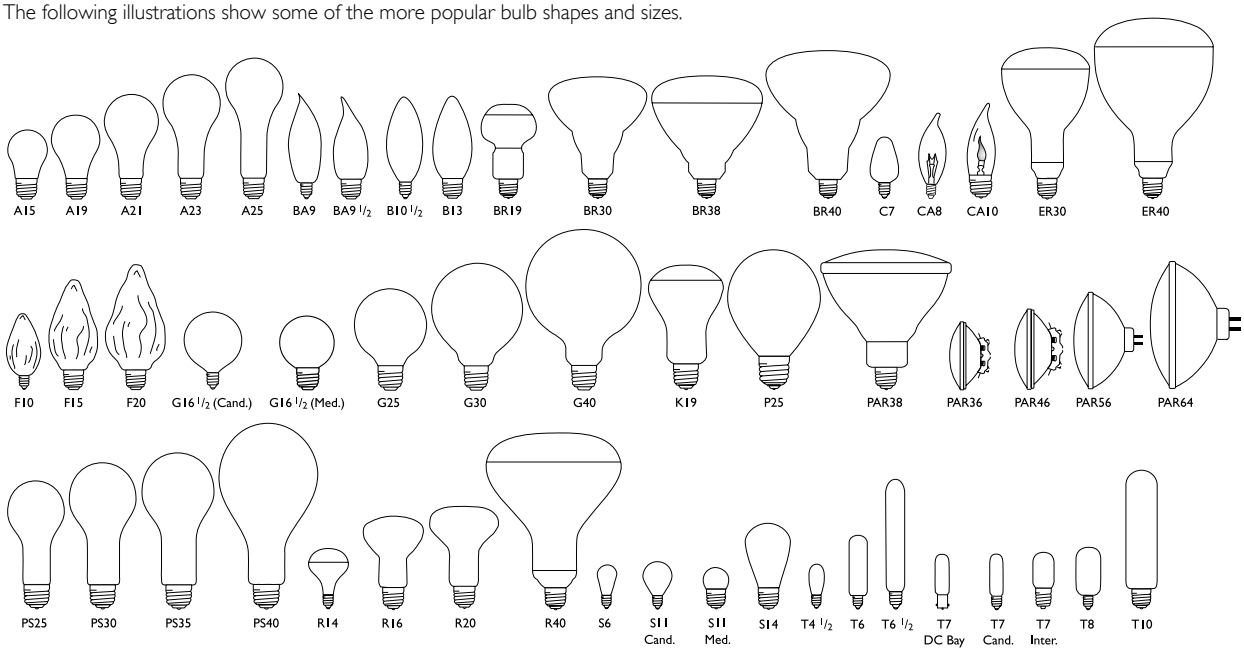


Base Types (Not Actual Sizes)



Bulb Shapes (Not Actual Sizes)

The size and shape of a bulb is designated by a letter or letters followed by a number. The letter indicates the shape of the bulb while the number indicates the diameter of the bulb in eighths of an inch. For example, "T10" indicates a tubular shaped bulb having a diameter of 1⅛ or 1¼ inches. The following illustrations show some of the more popular bulb shapes and sizes.



Incandescent Lamps

Symbols and Footnotes

For the most current product information, go to the e-catalog on www.philips.com

□ Exclusive to Philips Lighting Company

■ Nickel plated brass base

▲ Aluminum base

★ Heat resisting glass bulb

▯ Maximum Beam Candlepower

Ⓔ This Bulb Meets US Federal Minimum Efficiency Standard

† New since last printing

* Two Lamp Carded Pack

‡ Quantity shown is minimum shipping container—refer to Net Price Schedule for number of lamps to qualify as a standard case.

✔ Consider the compact fluorescent lamps listed on pages 52–69 or the energy saving halogen listed on pages 102–105 for energy savings

G = General Lighting

S = Street Lighting

▼ PAR38 (one piece)

¥ For more information about FTC requirements please see rule 16 CFR part 305 @ www.ftc/os/2000/02/16cfr305.

+ Pursuant to California law, these incandescent lamps cannot be used or offered for sale for use in traffic signals in the State of California.

++ Pursuant to California law, these incandescent lamps cannot be used or offered for sale in the State of California.

(4) Average laboratory life is 200 hours for vacuum cleaner and 600 hours for sewing machine service. Design life 1000 hours.

(8) Operate base down.

(12) Operate base down to horizontal.

(14) Operate base up.

(18) Base is medium left hand thread.

(19) May not give satisfactory performance if any accessory equipment is attached to or touches the glass bulb.

(27) Average laboratory life in excess of 5000 hours. In-service life depends upon service conditions.

(29) Suitable for indoor and outdoor service.

(31) Operate only in porcelain sockets.

(37) Should not be used in equipment where the base temperature will exceed 500°F.

(43) Unless otherwise noted, may be operated in any position, but lumen maintenance is best when operated vertically base up.

(46) Stippled, rounded cover.

(51) Light output is maintained best when operated within 45° of vertically base up.

(53) The bulb, though made of heat-resistant glass, may break if moisture falls on it. Not recommended for use in enclosed, close-fitting housings.

(63) Design volts 145.

(64) For use only in equipment specially designed to maintain bulb and base temperature within safe limits.

(66) Silicone Coating reduces lumen output from Standard Values less than 3%.

(82) CAUTION: To avoid deterioration of lampholder by heat, use only heat resistant lampholders or fixtures listed by a nationally recognized electrical testing organization for use with reflector or PAR lamps.

(87) Do not allow hot bulb to come in contact with liquid or metal parts of the fixture, as glass may shatter. Do not use outdoors. Do not operate in close proximity to flammable materials or those adversely affected by heat or drying. Operate only in heat resistant sockets.

(89) CAUTION: Do not operate in close proximity to flammable materials or those adversely affected by heat or drying. Operate only in heat resistant sockets.

WARNING: Use carefully. May cause serious burns. Do not use over insensitive skin areas or in the presence of poor circulation. The unattended use of infrared heat by children or incapacitated persons may be dangerous.

—Lamp should not be placed closer than 18" to the surface being irradiated.

—Do not use for therapeutic or topical applications unless recommended by a physician.

—For food warming, use only lamps with heat resisting glass.

(93) Rated average life is the length of operation (in hours) at which point an average of 50% of the lamps will still be operational and 50% will not.

WARNING: For indoor use only.

(445) Estimated energy cost is based on 3 hrs/day, 11¢/kWh. Cost depends on rates and use.

(446) Life in years is based on 3 hrs/day.

Halogen and Incandescent Replacement Guide

General Service Incandescent Lamps Affected by EISA Section 321*

Banned by Legislation		Professional and Consumer Replacement	
Product Number	Ordering Code	Product Number	Ordering Code
13254-8	100A/W 12/4	40982-1	72A19/EV
13255-5	100A/W/TP 24/4	40982-1	72A19/EV
13423-9	100G25/W/LL 12/1	—	—
13560-8	75A/NTL 12/4	22696-9	53A19/EV/NTL
13561-6	100A/NTL 12/4	22699-3	72A19/EV/NTL
13684-6	100A	40982-1	72A19/EV
13996-3	75A/CL 120/1 PRO	41048-0	72A19/EV/CL
13997-1	75A 120/1 PRO	40982-1	72A19/EV
13998-9	100A/CL 120/1 PRO	41048-0	72A19/EV/CL
13999-7	100A 120/1 PRO	40982-1	72A19/EV
14297-5	200/99IF	—	—
14997-0	75A/W 12/4	40982-1	72A19/EV
15000-3	75A-67A/99/EW	40982-1	72A19/EV
15001-1	100A-90A/99EW	40982-1	72A19/EV
15002-9	150A-135A/99/EW	—	—
15008-6	100A/CL/LL 12/2	41048-0	72A19/EV/CL
15009-4	150A/CL/LL 12/1 TP	—	—
15129-0	75A/NTL/2X 12/4	22696-9	53A19/EV/NTL
15130-8	100A/NTL/2X 12/4	22699-3	72A19/EV/NTL
16739-5	75A/WL 24/4	40982-1	72A19/EV
16740-3	100A/WL 24/4		
16801-3	75A/CL/LL 12/2	41048-0	72A19/EV/CL
16844-3	100F20/POSTLT/CL/LL 6/1		
16850-0	100G30/W/LL 6/1	—	—
16862-5	100A/WL 12/4		
16866-6	150A/WL 12/1	—	—
16879-9	75A/WL 12/4		
21386-8	BC70BT15/HAL/W	40982-1	72A19/EV
21443-7	38A/W/TP 12/4		
21444-5	38A/CL	41050-6	29A19/EV/CL
21446-0	38A/CL/LL 12-2 WP TP		
21447-8	38A/WL/TP 12/4	40983-9	29A19/EV
21452-8	57A/CL/LL/TP 12/2		
21453-6	71A/W/TP 24/4	40982-1	72A19/EV
21454-4	71A		
21455-1	71A/CL/LL 120V 12/2 WP TP	41048-0	72A19/EV/CL
21459-3	95A		
21460-1	95A/W 24/4	40982-1	72A19/EV
21461-9	95A/WL 24/4		
21463-5	57A/CL	40984-7	43A19/EV
21466-8	57A		
21469-2	71A	40982-1	72A19/EV
21470-0	71A/CL		
21473-4	95A/CL	41048-0	72A19/EV/CL
21474-2	95A		
21497-3	57A 12/4	40984-7	43A19/EV
21498-1	57A/W/TP 12/4		
21499-9	57A/WL 12/4 TP	40984-7	43A19/EV
21501-2	71A/W/TP 12/4		

* EISA Section 321 refers to energy efficiency standards for general service incandescent lamps.

Halogen and Incandescent Replacement Guide

General Service Incandescent Lamps Affected by EISA Section 321*

Banned by Legislation		Professional and Consumer Replacement	
Product Number	Ordering Code	Product Number	Ordering Code
21502-0	71A/WL 24/4	40982-1	72A19/EV
21503-8	71A/WL /TP 12/4	40982-1	72A19/EV
21504-6	95A/W/TP 12/4	40982-1	72A19/EV
21818-0	95A/WL 12/4	40982-1	72A19/EV
22240-6	75A-67A/EW	40982-1	72A19/EV
22241-4	75A-67A/EW	40982-1	72A19/EV
22243-0	100A-90A/EW	40982-1	72A19/EV
22244-8	100A-90A/EW	40982-1	72A19/EV
22430-3	100A23	—	—
22979-9	100A/99	40982-1	72A19/EV
23415-3	75A 120V 24-2LP/SL W/P	40982-1	72A19/EV
24135-6	75A/WL	40982-1	72A19/EV
24927-6	BC75BT15/HAL/W	40982-1	72A19/EV
24931-8	BC100BT15/HAL/W	40982-1	72A19/EV
26836-7	135A25/35	—	—
27069-4	150A	—	—
27083-5	75A 12/4	40982-1	72A19/EV
28171-7	100A21	—	—
28172-5	150A23	—	—
28173-3	150	—	—
28174-1	150PS25/99	—	—
28175-8	150A-135A/EW	—	—
31305-6	75A21	—	—
37406-6	75A/99	40982-1	72A19/EV
37411-6	100A21/35	—	—
37417-3	150A/99	—	—
37460-3	100A21/99	—	—
37472-8	75A	40982-1	72A19/EV
37473-6	75A	40982-1	72A19/EV
37474-4	100A	40982-1	72A19/EV
37476-9	100A	40982-1	72A19/EV
37485-0	75A/W 12/4	40982-1	72A19/EV
37486-8	75A/W/TP 24/4	40982-1	72A19/EV
37525-3	75A/CL	41048-0	72A19/EV/CL
37527-9	100A/CL	41048-0	72A19/EV/CL
40948-2	57A/W/TP	40984-7	43A19/EV

* EISA Section 321 refers to energy efficiency standards for general service incandescent lamps.

Halogen and Incandescent Replacement Guide

Incandescent Reflector Lamps Affected by EISA Section 322 & DOE Rulemaking*

Banned by Legislation		Professional Replacement		Consumer Replacement	
Product #	Ordering Code	Product #	Ordering Code	Product #	Ordering Code
13401-5	45PAR38/HAL/FL/LL	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
13402-3	90PAR38/HAL/FL/LL	13862-8	70PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
13403-1	90PAR38/HAL/FL/LL	13862-8	70PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
13404-9	45PAR38/HAL/SP/LL	23844-4	39PAR38/IRC+/SP10	41943-2	39PAR38/EV/SP10
13405-6	90PAR38/HAL/SP/LL	13861-0	70PAR38/IRC+/SP10	41938-2	72PAR38/EV/SP10
13407-2	50PAR30L/HAL/FL/LL	23429-4	50PAR30L/IRC+/FL25	41974-7	39PAR30L/EV/FL25
13408-0	75PAR30L/HAL/FL/LL	23429-4	50PAR30L/IRC+/FL25	41954-9	53PAR30L/EV/FL25
13409-8	75PAR30L/HAL/SP/LL	23799-0	50PAR30L/IRC+/SP10	41956-4	53PAR30L/EV/SP10
13410-6	50PAR20/HAL/FL/LL	15216-5	20PAR20E/HAL/FL25	41986-1	39PAR20/EV/FL25
13411-4	50PAR20/HAL/SP/LL	15216-5	20PAR20E/HAL/FL25	41973-9	39PAR20/EV/SP10
13467-6	75PAR30S/HAL/FL25	23856-8	55PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
13846-1	50PAR20/HAL/SP10	40494-7	20PAR20E/HAL/SP10	41973-9	39PAR20/EV/SP10
13848-7	75PAR30L/HAL/SP10	23799-0	50PAR30L/IRC+/SP10	41956-4	53PAR30L/EV/SP10
13849-5	75PAR30S/HAL/SP10	23855-0	55PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10
13853-7	50PAR30S/IRC/HAL/SP10	23853-5	39PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10
13854-5	50PAR30S/IRC/HAL/FL25	23854-3	39PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
13855-2	50PAR30S/IRC/HAL/WFL40	23854-3	39PAR30S/IRC+/FL25	—	—
13856-0	45PAR38/IRC/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
13857-8	45PAR38/IRC/HAL/WFL40	23849-3	55PAR38/IRC+/WFL40	—	—
13858-6	55PAR38/IRC/HAL/SP10	14505-2	50PAR38/IRC+/SP10	41945-7	53PAR38/EV/SP10
13859-4	55PAR38/IRC/HAL/FL25	14506-0	50PAR38/IRC+/FL25	41944-0	53PAR38/EV/FL25
13860-2	55PAR38/IRC/HAL/WFL40	14507-8	50PAR38/IRC/WFL40	—	—
13864-4	90PAR38/IRC/HAL/SP10	13861-0	70PAR38/IRC+/SP10	—	—
13865-1	90PAR38/IRC/HAL/FL25	13862-8	70PAR38/IRC+/FL25	42498-5	83PAR38/EV/FL25/LL
13866-9	90PAR38/IRC/HAL/WFL40	13863-6	70PAR38/IRC+/WFL40	—	—
13873-5	60PAR38/IRC/HAL/SP10	23847-7	55PAR38/IRC+/SP10	41938-2	72PAR38/EV/SP10
13874-3	60PAR38/IRC/HAL/FL25	23865-9	55PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
13875-0	60PAR38/IRC/HAL/WFL40	23849-3	55PAR38/IRC+/WFL40	—	—
13879-2	60PAR38/IRC/HAL/FL25	23865-9	55PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
13918-8	60PAR38/IRC/HAL/WFL40	23849-3	55PAR38/IRC+/WFL40	—	—
13919-6	45PAR38/IRC/HAL/SP10	23844-4	39PAR38/IRC+/SP10	41943-2	39PAR38/EV/SP10
13920-4	60PAR38/IRC/HAL/SP10	23847-7	55PAR38/IRC+/SP10	41938-2	72PAR38/EV/SP10
14022-8	60PAR38/HAL/FL/LL	23845-1	39PAR38/IRC+/FL25	42128-9	39PAR38/EV/FL25/LL
14482-4	60PAR38/HAL/SP10	23844-4	39PAR38/IRC+/SP10	41944-0	53PAR38/EV/FL25
14483-2	60PAR38/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41945-7	53PAR38/EV/SP10
14484-0	60PAR38/HAL/WFL40	23849-3	55PAR38/IRC+/WFL40	—	—
14485-7	75PAR38/HAL/SP10	23847-7	55PAR38/IRC+/SP10	41945-7	53PAR38/EV/SP10
14486-5	75PAR38/HAL/FL25	23865-9	55PAR38/IRC+/FL25	41944-0	53PAR38/EV/FL25
14487-3	90PAR38/HAL/WFL40	13863-6	70PAR38/IRC+/WFL40	—	—
14488-1	60PAR38/HAL/SP10	23844-4	39PAR38/IRC+/SP10	41944-0	53PAR38/EV/FL25
14489-9	60PAR38/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41945-7	53PAR38/EV/SP10
14490-7	60PAR38/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41945-7	53PAR38/EV/SP10
14491-5	60PAR38/HAL/WFL40	23849-3	55PAR38/IRC+/WFL40	—	—
14493-1	75PAR38/HAL/SP10	23847-7	55PAR38/IRC+/SP10	41945-7	53PAR38/EV/SP10
14494-9	75PAR38/HAL/FL25	23865-9	55PAR38/IRC+/FL25	41944-0	53PAR38/EV/FL25
14495-5	90PAR38/HAL/WFL40	13863-6	70PAR38/IRC+/WFL40	—	—
14496-3	40PAR30S/IRC/HAL/SP10	23853-5	39PAR30S/IRC+/SP10	42111-5	39PAR30S/EV/SP10
14497-1	40PAR30S/IRC/HAL/FL25	23854-3	39PAR30S/IRC+/FL25	42110-7	39PAR30S/EV/FL25
14498-9	40PAR30S/IRC/HAL/WFL40	23854-3	39PAR30S/IRC+/FL25	42110-7	39PAR30S/EV/FL25
14499-7	50PAR30S/IRC+/SP10	23853-5	39PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10
14500-3	50PAR30S/IRC+/FL25	23854-3	39PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
14501-1	50PAR30S/IRC+/WFL40	23854-3	39PAR30S/IRC+/FL25	—	—
14502-9	40PAR38/IRC/HAL/SP10	23844-4	39PAR38/IRC+/SP10	41943-2	39PAR38/EV/SP10
14503-7	40PAR38/IRC/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
14504-5	40PAR38/IRC/HAL/WFL40	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
14507-8	50PAR38/IRC/HAL/WFL40	23849-3	55PAR38/IRC+/WFL40	—	—
14720-7	75PAR38/NLP/FL	23865-9	55PAR38/IRC+/FL25	41944-0	53PAR38/EV/FL25
14989-8	60PAR30S/IRC/HAL/WFL40	23857-6	55PAR30S/IRC+/WFL40	—	—
15004-5	60PAR30S/IRC/HAL/SP10	23855-0	55PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10

* EISA Section 322 & DOE Rulemaking refers to energy efficiency standards for incandescent reflector lamps.

Halogen and Incandescent Replacement Guide

Incandescent Reflector Lamps Affected by EISA Section 322 & DOE Rulemaking*

Banned by Legislation		Professional Replacement		Consumer Replacement	
Product #	Ordering Code	Product #	Ordering Code	Product #	Ordering Code
15007-8	60PAR30S/IRC/HAL/FL25	23856-8	55PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
15879-0	60BR30/HAL/FL	21359-5	40BR30/HEA/FL	42118-0	50BR30/EV/FL
20231-7	45PAR38/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
20234-1	90PAR38/HAL/FL25	13862-8	70PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
20257-2	60BR30/HAL/NLP/FL	—	—	—	—
20573-2	60BR40/HAL/NLP/FL	—	—	—	—
20579-9	60BR30/HAL/FL/LL	21359-5	40BR30/HEA/FL	42118-0	50BR30/EV/FL
20580-7	60BR40/HAL/FL/LL	22238-0	40BR40/HEA/FL	42116-4	40BR40/EV/FL
22486-5	60K19/DL	—	—	—	—
22906-2	50PAR20/HAL/SP10	40494-7	20PAR20E/HAL/SP10	41973-9	39PAR20/EV/SP10
22911-2	50PAR20/HAL/FL25	15216-5	20PAR20E/HAL/FL25	41986-1	39PAR20/EV/FL25
22921-1	50PAR20/HAL/FL25	15216-5	20PAR20E/HAL/FL25	41986-1	39PAR20/EV/FL25
22922-9	50PAR30L/HAL/SP10	23799-0	50PAR30L/IRC+/SP10	42303-8	39PAR30L/EV/SP10
22923-7	50PAR30L/HAL/WSP16	23799-0	50PAR30L/IRC+/SP10	42303-8	39PAR30L/EV/SP10
22925-2	50PAR30L/HAL/FL25	23429-4	50PAR30L/IRC+/FL25	41942-4	39PAR38/EV/FL25
22926-0	50PAR30L/HAL/FL25	23429-4	50PAR30L/IRC+/FL25	41942-4	39PAR38/EV/FL25
22927-8	50PAR30L/HAL/WFL40	23800-6	50PAR30L/IRC+/WFL40	—	—
22928-6	50PAR30L/HAL/WFL40	23800-6	50PAR30L/IRC+/WFL40	—	—
22930-2	75PAR30L/HAL/SP10	23799-0	50PAR30L/IRC+/SP10	41956-4	53PAR30L/EV/SP10
22934-4	75PAR30L/HAL/WSP16	23799-0	50PAR30L/IRC+/SP10	41956-4	53PAR30L/EV/SP10
22941-9	75PAR30L/HAL/FL25	23429-4	50PAR30L/IRC+/FL25	41954-9	53PAR30L/EV/FL25
22943-5	75PAR30L/HAL/FL25	23429-4	50PAR30L/IRC+/FL25	41954-9	53PAR30L/EV/FL25
22944-3	75PAR30L/HAL/WFL40	23800-6	50PAR30L/IRC+/WFL40	—	—
22945-0	75PAR30L/HAL/WFL40	23800-6	50PAR30L/IRC+/WFL40	—	—
22946-8	45PAR38/HAL/SP10	23844-4	39PAR38/IRC+/SP10	41943-2	39PAR38/EV/SP10
22947-6	45PAR38/HAL/SP10	23844-4	39PAR38/IRC+/SP10	41943-2	39PAR38/EV/SP10
22949-2	45PAR38/HAL/FL25	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
23069-8	90PAR38/HAL/SP10	13861-0	70PAR38/IRC+/SP10	41938-2	72PAR38/EV/SP10
23650-5	90PAR38/HAL/SP10	13861-0	70PAR38/IRC+/SP10	41938-2	72PAR38/EV/SP10
23651-3	90PAR38/HAL/FL25	13862-8	70PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
26349-1	50PAR30S/HAL/SP10	23853-5	39PAR30S/IRC+/SP10	—	—
26357-4	50PAR30S/HAL/SP10	23853-5	39PAR30S/IRC+/SP10	—	—
26358-2	50PAR30S/HAL/FL25	23854-3	39PAR30S/IRC+/FL25	—	—
26362-4	50PAR30S/HAL/FL25	23854-3	39PAR30S/IRC+/FL25	—	—
26364-0	50PAR30S/HAL/WFL40	23854-3	39PAR30S/IRC+/FL25	—	—
26384-8	50PAR30S/HAL/WFL40	23854-3	39PAR30S/IRC+/FL25	—	—
26877-1	90PAR38/HAL/FL	13862-8	70PAR38/IRC+/FL25	41940-8	72PAR38/EV/FL25
26883-9	45PAR38/HAL/FL	23845-1	39PAR38/IRC+/FL25	41942-4	39PAR38/EV/FL25
27429-0	90PAR38/HAL/FL	13862-8	70PAR38/IRC+/FL25	41946-5	72PAR38/EV/FL25
28479-4	75PAR30S/HAL/SP10	23855-0	55PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10
28488-5	75PAR30S/HAL/FL25	23856-8	55PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
28491-9	75PAR30S/HAL/WFL40	23857-6	55PAR30S/IRC+/WFL40	—	—
28492-7	75PAR30S/HAL/WFL40	23857-6	55PAR30S/IRC+/WFL40	—	—
30728-0	40K19/DL	—	—	—	—
35751-7	60PAR30S/HAL/SP10	23855-0	55PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10
35752-5	60PAR30S/HAL/SP10	23855-0	55PAR30S/IRC+/SP10	42112-3	53PAR30S/EV/SP10
35753-3	60PAR30S/HAL/FL25	23856-8	55PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
35758-2	60PAR30S/HAL/WFL40	23857-6	55PAR30S/IRC+/WFL40	—	—
35762-4	60PAR30S/HAL/WFL40	23857-6	55PAR30S/IRC+/WFL40	—	—
35788-9	60PAR30S/HAL/FL25	23856-8	55PAR30S/IRC+/FL25	42143-8	53PAR30S/EV/FL25
38849-6	60BR30/HAL/FL	21359-5	40BR30/HEA/FL	42118-0	50BR30/EV/FL
38875-1	60BR30/HAL/SP	—	—	—	—
38884-3	60PAR38/HAL/2FL	—	—	—	—
38886-8	90PAR38/HAL/2FL	—	—	—	—
38887-6	60PAR38/HAL/3FL	38890-0	90PAR38/HAL/3FL	—	—
38925-4	90PAR38/HAL/FL	13862-8	70PAR38/IRC+/FL25	41941-6	72PAR38/EV/FL25
39174-8	60BR40/HAL/FL	22238-0	40BR40/HEA/FL	42116-4	40BR40/EV/FL

* EISA Section 322 & DOE Rulemaking refers to energy efficiency standards for incandescent reflector lamps.

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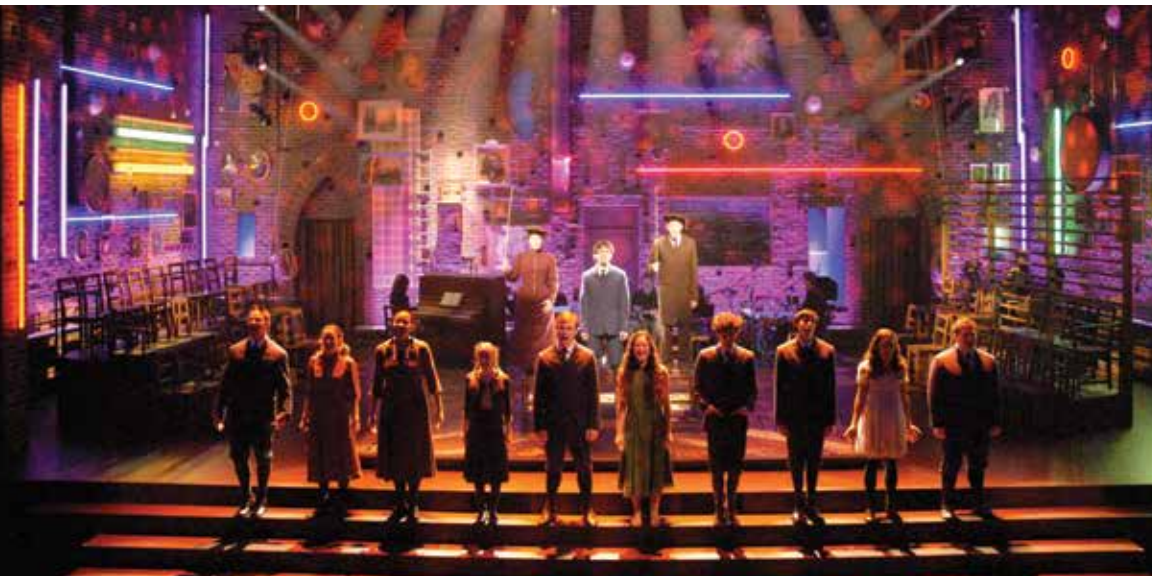
Germicidal Sterilamp 254nm Lamps

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TUV T5

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Philips FastFit Lamps feature a rear loading base system which enables easy lamp replacement.

Reliable, high quality lamps provide ultimate performance

Philips HPL+ Lamps with P3 technology enable flexible burning positions to ensure accurate aiming and supply of light wherever it is needed. HPL+ lamps are now designed to last longer, making them ideal for theater, studio and event lighting.

Philips FastFit is a new lamp concept for Single Ended MSR Gold and Halogen Hi-Brite lamp types. The rear load base system enables easy lamp replacement and adjustments in seconds in difficult stage conditions. The overall lamp length is reduced making more compact and lighter fixture designs possible.

Philips Germicidal T5 Sterilamp featuring ALTO Lamp Technology uses UV technology, which allows for the emission of UVC energy to disinfect water, therefore the Philips Germicidal T5 Sterilamp is a cost effective and environmentally responsible disinfection alternative to chemical treatment of waste water.

† UVC is a band of ultraviolet radiation with wavelengths shorter than 280 nanometers.



HPL+ Lamps



MSR Hot Restrike Lamps



FastFit Lamps



TUV Amalgam XPT System



Germicidal T5 Sterilamp

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Specialty Lamps

Photo Projection Lamps

ANSI Code	Product Number	Pkg. Qty.	Volts	Avg. Watts (Amps)	Bulb	Base	Rated Avg. Life (Hrs.)*	Coil Type	LCL (In.)	LCL (mm.)	MOL (In.)	MOL (mm.)	Rated Approx. Lumens	Color Temp (K)	Operating Position
Photo Projection Lamps															
BRL	31627-3	24	12	50	T3.5	G6.35	50	C-6	1⅜	30	1 73/100	44.0	1500	3400	BDTH
DDL	31509-3	24	20	150	MR16	GX5.3	500	CC-6	—	—	1¾	44.5	—	3150	BDTH
DZA	28117-0	100	10.8	30	T5	G5.3	1000	—	—	—	1 1/20	47.0	570	3100	BDTH
EFN	31502-8	50	12	75	MR16	GZ6.35	50	C-6	—	—	1 3/20	42.0	—	3350	BDTH
EFP	31488-0	50	12	100	MR16	GZ6.35	50	C-6	—	—	1 3/20	42.0	—	3350	BDTH
EFR	31490-6	50	15	150	MR16	GZ6.35	50	C-6	—	—	1 3/20	42.0	—	3350	BDTH
EFP/5H	13163-1	50	12	100	MR16	GZ6.35	500				1¾	42.0	580	3400	ANY
EFR/5H	13656-4	50	15	150	MR16	GZ6.35	500				1¾	42.0	720	3400	ANY
EHJ	31758-6	100	24	250	T4	G6.35	50	C-6F	1 3/10	33	2 7/100	55.0	9400	3400	BD
EHJ-X	23175-3	200	24	250	T4	G6.35	50	C-6F	1 3/10	33	2 7/100	55.0	10,000	3400	BD
EJA	44142-8	24	21	150	MR16	GX5.3	40	CC-6	—	—	1 1/20	44.5	—	3350	BDTH
EJL	31508-5	24	24	200	MR16	GX5.3	50	CC-6	—	—	1 1/20	44.5	—	3400	BDTH
EJM	23942-6	24	21	150	MR16	GX5.3	40	CC-6	—	—	1¾	44.5	—	3400	BDTH
EKE	31592-9	24	21	150	MR16	GX5.3	200	CC-6	—	—	1¾	44.5	—	3400	BDTH
ELC	23103-5	24	24	250	MR16	GX5.3	50	CC-6	—	—	1¾	44.5	—	3400	BDTH
ELC/5H	38166-5	24	24	250	MR16	GX5.3	500	CC-6	—	—	1¾	44.5	—	3400	BDTH
ELC/10H	13658-0	24	24	250	MR16	GX5.3	1000	CC-6	—	—	1¾	45.0	—	3400	BDTH
ELD	31618-2	24	21	150	MR16	GX5.3	40	CC-6	—	—	1 1/20	44.5	—	3350	BDTH
ELH	31619-0	24	120	300	MR16	GY5.3	35	CC-8	—	—	1 1/20	44.5	—	3350	BDTH
ENH	31621-6	24	120	250	MR16	GV5.3	175	CC-8	—	—	1¾	44.5	—	3250	BDTH
EPZ/DJT	31496-3	50	13.8	50	MR16	GX5.3	1000							3150	BDTH
ESA/FHD	26126-3	100	6	10	T2.5	G4	100	C-6	⅞	19.6	1 3/20	30.0	200	3200	ANY
ESB	25678-4	100	6	20	T3	G4	100	C-6	⅞	19.5	1⅜	31.0	420	3200	ANY
EVA	25676-8	100	12	100	T3.5	GY6.35	1000	C-6F	1 3/50	30	1 73/100	44.0	2500	3200	ANY
EVC	31884-0	24	24	250	T5	G6.35	300	C-6F	1 3/10	33	2 2/25	57.0	8400	3200	ANY
EVD-X	23177-9	24	36	400	T6	G6.35	50	C-6F	1 21/50	36.1	2 2/25	59.9	16,625	3400	BDTH
EYB	23257-9	24	82	360	T5	G5.3	75	CC-8	1¼	31	2¼	57.0	10,000	3250	BDTH
FCR	26101-6	100	12	100	T3.5	GY6.35	50	C-6F	1 3/50	30	1 73/100	44.0	3400	3400	BDTH
FCS	20607-8	200	24	150	T4	G6.35	50	C-6F	1 3/50	30	2	50.8	5200	3400	BDTH
FCS-X	23174-6	100	24	150	T4	G6.35	50	C-6F	1 3/50	30	2	50.8	6000	3400	BDTH
FJX	31499-7	50	13.8	30	MR16	GX5.3	500	C-8	—	—	1⅞	44.9	—	3150	ANY
FLW	20492-5	24	24	300	T6	GY6.3	50	C-6F	1 3/10	33	2 7/10	55.0	10,450	3400	BD±15°
JCR	24923-5	24	15	150	MR16	GZ6.35	500	C-8	—	—	1 3/20	42.0	—	—	BDTH
5761	25713-9	100	6	30	T3.5	G4	100	C-6F	⅞	19.6	1⅜	31.0	765	3200	ANY
6605	25684-2	100	6	10	T3	G4	2000	C-6	⅞	19.5	1⅜	30.0	150	2700	ANY
13117	37614-5	50	17	150	MR16	GX5.3	1000	CC-6	—	—	1 1/20	47.0	—	3200	ANY
13165	44295-4	50	14	35	MR11	GZ4	50	—	—	—	1½	38.0	—	—	BD±130°
13298	16094-5	50	10	52	MR11	GZ4	20	CC-8	—	—	1⅞	44.9	—	—	HORIZ.±40°
13528	31504-4	360	6	15	MR11	GZ4	500	C-6	—	—	1½	38.0	—	—	BD±105°
13865	26423-4	50	12	75	MR11	G5.3	50	—	—	—	1 53/100	40.0	—	—	BD±105°
14623	15881-6	100	17	95	T4	GY6.35	2000	C-8	—	—	1 93/100	50.0	2150	3000	ANY

* Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not

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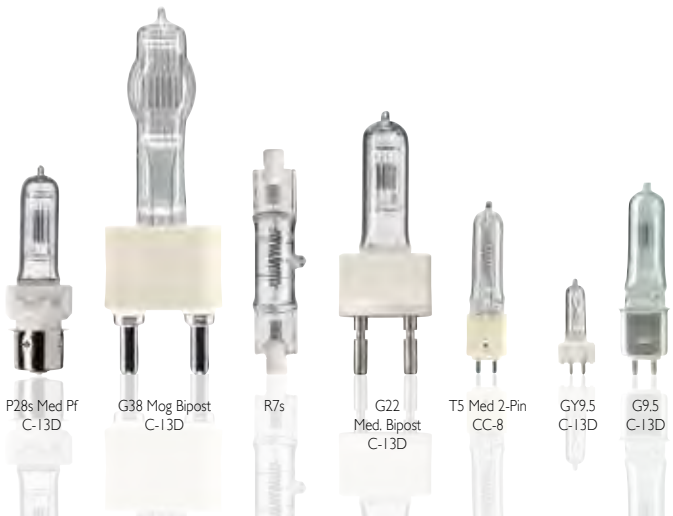


ANSI Code	Product Number	Watts	Description	Volts	Base	MOL (In.)	LCL (In.)	Mean Lumens	Rated Avg. Life (Hrs.)*	Filament	Color Temp (K)	Envelope Finish
Stage/Studio/TV Lamps												
BTL	31891-5	500		120	Med. Pf.	4½	2⅝	11,000	500	C-13D	3050	Clear
BTN	20481-8	750		120	Med. Pf.	4½	2⅜	17,600	500	C-13D	3050	Clear
CYV	31892-3	1000		120	Mog. Bipost	7¾	5	28,500	200	C-13D	3200	Clear
CYX	31893-1	2000		120	Mog. Bipost	8½	5	59,000	300	C-13D	3200	Clear
DWT	38295-2	1000	1000T6Q/CL	120	R7s	5⅝		23,400	2000	CC-8	3000	Clear
EGT	31896-4	1000		120	Med. Bipost	5½	2½	28,500	250	C-13D	3200	Clear
FEL	26979-5	1000	1000Q/CL	120	Med. 2-Pin	4	2⅜	27,500	300	CC-8	3200	Clear
FRK	14952-6	650	6638P	120	GY9.5	1⅞		17,500	200	C-13D	3200	Clear
GKV	36372-1	600	6986P	230	G9.5	4½	2⅜	15,000	400	C-13D	3200	Clear
GKV	27287-2	600	6986P	240	G9.5	3⅞	2⅜	15,000	300	Bi-Plane	3200	Clear
GLA	29432-2	575	6992P	115	G9.5	4	2⅜	13,000	1500	C-13D	3100	Clear
GLB	36373-9	575	6991P	230	G9.5	4	2⅜	13,000	1500	C-13D	3100	Clear
GLB	27289-8	600	6991P	240	G9.5	4	2⅜	13,000	1500	Bi-Plane	3100	Clear
GLC	28739-1	575	6989P	115	G9.5	4	2⅜	15,500	400	C-13D	3200	Clear
GLD	13420-5	750	6981P	115	G9.5	4	2⅜	20,500	300	C-13D	3200	Clear
6980Z	38296-0	1200	6980Z	80	G22	5½	2½	37,500	200	C-13D	3250	Clear
7002Y	38297-8	1000	7002Y 115V	115	G22	6	2½	29,000	250	Bi-Plane	3200	Clear
7015 TXO	15179-5	750	7015 TXO	100	GX9.5	3¾	1½	18,600	300	C-13	3200	Clear

* Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not

Unless otherwise noted all dimensions are in inches. To convert inches to millimeters multiply by 25.4001.

For the most current product information, go to the e-catalog on **www.philips.com**



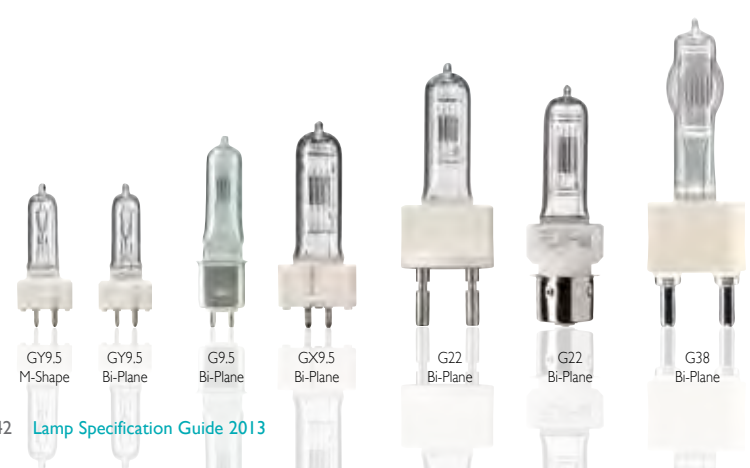
Specialty Lamps

High Volt SSTV Halogen Lamps

ANSI Code	Product Number	Watts	Description	Volts	Base	MOL (In.)	LCL (In.)	Mean Lumens	Rated Avg. Life (Hrs.)*	Filament	Color Temp (K)	Burning Position	Pkg. Qty.	Monoplane Equiv. LIF	LIF
High Volt SSTV Halogen Lamps															
Single-Ended															
FSL	25813-7	300	6872P	230	GY9.5	3½	1⅝	7800	180	M	3200	ANY	10	CP/81	
GCV/GVH	25796-4	500	6820P	230	GY9.5	3½	1⅝	11,000	360	Bi-Plane	3000	BDTH	10	T/25	T/18
FRH	25806-1	500	6873P	230	GY9.5	3½	1⅝	13,500	180	M	3200	ANY	10	CP/82	
7389	14104-4	500	7389	230	GY9.5	3	1 1⁄32	14,000	75	Bi-Plane	3200	BDTH	10	A1/224	
GKV	36372-1	600	6986P	230	G9.5	4	2⅜	15,000	300	Bi-Plane	3200	ANY	10		
6998P	14103-6	650	6998P	230	GX9.5	4⅜	2⅛	13,000	750	Bi-Plane	3000	ANY	10	T 21	
GCK/GCT	25794-9	650	6823P	230	GY9.5	3½	1⅝	14,500	600	Bi-Plane	3050	BDTH	10	T/27	T/26
FKH	25820-2	650	6993Z	230	G22	5½	2½	16,500	120	Bi-Plane	3200	BDTH	10	CP/68	CP/39
6982P	13421-3	800	6982P	230	G9.5	4⅛	2⅜	20,000	200	Bi-Plane	3200	ANY	10		
6982P	27284-9	800	6982P	240	G9.5	4	2⅜	20,000	200	Bi-Plane	3200	ANY	10		
FEP	14107-7	1000	6983P	230	G9.5	4	2⅜	26,000	250	Bi-Plane	3200	ANY	10	CP/77	
FVA	14108-5	1000	6995P	230	GX9.5	4⅓	2⅛	25,000	240	Bi-Plane	3200	BDTH	10	CP/70	CP/24
FKD	25803-8	1000	6996C	230	P28s	5	2⅛	21,000	900	Bi-Plane	3050	BDTH	10	T/20	T/14
7002Y	13041-9	1000	7002Y	230	G22	5½	2½	29,000	250	Bi-Plane	3200	ANY	10		
FKJ	14247-1	1000	6995Z	230	G22	5½	2⅛	25,000	240	Bi-Plane	3200	ANY	10	T/20	
FWP	25804-6	1000	6996P	230	GX9.5	4	2⅛	21,000	900	Bi-Plane	3050	ANY	10	T/19	
FWR	27336-7	1000	6996P	240	GX9.5	4	2⅛	21,000	900	Bi-Plane	3050	ANY	10	T/19	
FWS	14105-1	1200	6897P	230	GX9.5	4¾	2⅝	27,600	400	Bi-Plane	3000	ANY	10	T/29	
FWT	27275-7	1,200	6897P	240	GX9.5	4 3⁄4	2 5⁄8	27,600	480	Bi-Plane	3000	ANY	10		T/29
6800C	27250-0	500	6800C	240	P28	5⅛	2⅛	9500	900	Bi-Plane	2950	ANY	10	T/24	T17
6963Z	29093-2	5000	6963Z	230	G38	11	6½	132,500	400	Bi-Plane	3200	ANY	1	CP/85	CP/29
7009Z	22399-0	1200	7009Z	80	G22	6	72½	36,000	200	Bi-Plane	3250	BDTH	10	—	—
6984P	27286-4	1000	6984P	230	GX9.5	4⅗	2⅛	22,500	180	Bi-Plane	3200		10	CP/63	
6895P	27223-7	1200	6895P	230	GX9.5	4⅗	2⅝	30,000	240	Bi-Plane	3200		10	CP/90	
FVC	27290-6	650	6993P	230	GX9.5	4⅗	2⅛	16,500	120	Bi-Plane	3200		10	CP/67	CP/23
FTM	27293-0	2000	6994P	230	GY16	5⅗	2¾	50,000	450	Bi-Plane	3200		10	CP/72	CP/43
FKK/FKP	27301-1	2000	6994Z	230	G38	8⅗	5	50,000	480	Bi-Plane	3200		10	CP/73	CP/41
6994Y	27297-1	2000	6994Y	230	G22	6⅗	3	50,000	480	Bi-Plane	3200		10	CP/75	CP/55
FRL	27245-0	650	6638P	230	GY9.5	3⅝	1⅝	16,500	180	Bi-Plane	3200	ANY	10	CP/89	
FRM	27246-8	650	6638P	240	GY9.5	3½	1⅝	16,500	180	Bi-Plane	3200	ANY	10	CP/89	
FEP	27285-6	1000	6983P	240	G9.5	4⅛	2⅜	26,000	180		3200	ANY	10	CP/77	
FVB	27307-8	1000	6995P	240	GX9.5	4⅓	2⅛	25,000	240	Bi-Plane	3200	ANY	10	CP/70	CP/24
FKJ	27333-4	1000	6995Z	240	G22	5½	2½	25,000	240	Bi-Plane	3200	ANY	10	CP/71	CP/40
FTL	27294-8	2000	6994P	240	GY16	5⅗	2⅗	50,000	450	Bi-Plane	3200		10	CP/72	CP/43
GAB	27303-7	1000	6995I/BP	230	GY9.5	3⅓	1⅝	25,000	250	Bi-Plane	3200		10		
GCW/GCJ	27254-2	500	3820P	240	GY9.5	3½	1⅝	11,000	360	Bi-Plane	3000	ANY	10	T/25	T/18
FSK	16668-6	300	6872P	240	GY9.5	3½	1⅝	7050	150		3200	ANY	10	CP/81	
FRJ	27261-7	500	6873P	240	GY9.5	3½	1⅝	13,500	150		3200	ANY	10	CP/82	
6874P	27263-3	300	6874P	240	GY9.5	3⅓	1⅝	5100	2000		2950	ANY	10	M/38	
6877P	27266-6	500	6877P	240	GY9.5	3⅓	1⅝	10,000	2000		2950	ANY	10	M/40	

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High Volt SSTV Halogen Lamps Continued

Single-Ended

ANSI Code	Product Number	Watts	Description	Volts	Base	MOL (In.)	LCL (In.)	Mean Lumens	Rated Avg. Life (Hrs.)*	Filament	Color Temp (K)	Burning Position	Pkg. Qty.	Monoplane Equiv. LIF	LIF
6975Z	27281-5	2000	6975Z	240	G22	6⅝	3½	50,000	400	Bi-Plane	3200		10	CP/92	
GAD	27304-5	1000	6995I/BP	240	GY9.5	3⅞	1⅜	25,000	250	Bi-Plane	3200		10		
7002Y	15620-8	1000	7002Y	240	G22	5½	2½	29,000	250	Bi-Plane	3200	ANY	10	T19	
FKK/FKP	27302-9	2000	6994Z	240	G38	8⅞	5	50,000	480	Bi-Plane	3200		10	CP/73	CP/41
VL300	16611-6	300	VL300	120	GX6.35	2 1/4	1 1/4	8,700	20	M	3200	ANY	20		
VL300	29180-7	300	VL300	230	GX6.35	2 1/4	1 1/4	8,550	20	M	3200	ANY	20		

HPL SSTV Lamps

HPL

ANSI Code	Product Number	Watts	Description	Volts	Base	MOL (In.)	LCL (In.)	Mean Lumens	Rated Avg. Life (Hrs.)*	Filament	Color Temp (K)	Envelope Finish
HPL 575 115V	39170-6	575	7007	115	Heat Sink	4	2⅜	16,520	300	Bi-Plane	3250	Clear
HPL 575 230V	14564-9	575	7007	230	Heat Sink	4	2⅜	14,900	400	Bi-Plane	3200	Clear
HPL 575 240V	27343-3	575	7007	240	Heat Sink	4	2⅜	14,900	400	Bi-Plane	3200	Clear
HPL 575LL 115V	39167-2	575	7007 LL	115	Heat Sink	4	2⅜	12,360	2000	Bi-Plane	3050	Clear
HPL 575LL 230V	14565-6	575	7007 LL	230	Heat Sink	4	2⅜	11,760	1500	Bi-Plane	3050	Clear
HPL 575LL 240V	27345-8	575	7007 LL	240	Heat Sink	4	2⅜	11,760	1500	Bi-Plane	3050	Clear
HPL 750 115V	39171-4	750	7008	115	Heat Sink	4	2⅜	21,900	300	Bi-Plane	3250	Clear
HPL 750 230V	14566-4	750	7008	230	Heat Sink	4	2⅜	19,750	300	Bi-Plane	3200	Clear
HPL 750 240V	27346-6	750	7008	240	Heat Sink	4	2⅜	19,750	300	Bi-Plane	3200	Clear

Double-Ended

ANSI Code	Product Number	Watts	Description	Volts	Base	MOL (In.)	LL (In.)	LCL (In.)	Mean Lumens	Rated Avg. Life (Hrs.)*	Filament (2)	Color Temp (K)	Burning Position	Pkg. Qty.	LIF	Monoplane Equiv. LIF
EME(1)(2)	31349-4	800	13477 R	230	R7s	4⅜	2½	—	23,600	150	C-8	3200	HORIZ. ±15°	10	P2/11	
EME(1)(2)	27231-0	800	13477R	240	R7s	4⅜	2½		24,400	150	Single Coil	3200	p15	10	P 2/11	
13704R	27085-0	1000	13704R	230	R7s	3⅜	1⅛	—	26,600	150	C-8	3200	ANY	10	P 2/35	
7786R	27072-8	1000	7786R	230	R7s	4⅜	2⅜	—	30,000	300	C-8	3200	HORIZ. ±15°			
7786R	27355-7	1000	7786R	240	R7s	4⅜	2⅜	—	30,000	300	Single Coil	3200	p15	10	P 2/20	
EKM(1)(2)	29089-0	1000	13989R	230	R7s	7⅞	—	—	26,000	200	Single Coil	3200	ANY	10	P 2/7	
EKM(1)(2)	27237-7	1000	13989R	240	R7s	7⅞	—	—	26,000	200	Single Coil	3200	ANY	10	P 2/7	
6358R	27493-6	1250	6358R	230	R7s				33,750	200	Single Coil	3200	p15	10	P 2/12	
6358R	27243-5	1250	6358R	240	R7s				33,750	200	Single Coil	3200	p15	10	P 2/12	
7775R/16	25841-8	625	7775R/16	230	R7s				16,250	150	Single Coil	3200	p15	10	P 2/10	
FDG	27363-1	1000	PF801 R	230	R7s				34,000	15		3400	ANY	10	P 1/12	
DXX	27230-2	800	13162R	240	R7s				21,600	75		3200	p15	50	P 2/13	

1) These lamp types must be operated with a separate rapid acting High Breaking-Capacity fuse, either 415V AC or 500V DC working in accordance with the supply in use as per end of table.
2) C.C.=coiled coil, S.C.=single coil
* Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not

For the most current product information, go to the e-catalog on **www.philips.com**



Specialty Lamps

MSR Lamps

Description	Product Number	Watts	Volts	Lamp Current (Amps)	Initial Lumens	Rated Avg. Life (Hrs.)*	Arc Length (mm)	CRI	Color Temp (K)	Base
MSR Lamps Single-Ended Gas Discharge										
Hot Restrike[1,2]										
MSR 125 HR	24497-0	125	80	1.90	9400	200	4	92	6000	GZX9.5
MSR 200 HR	24499-6	200	70	3.30	15,000	200	5	92	6000	GZY9.5
MSR 250 HR	24518-3	250	96	2.60	20,000	750	5	90	6000	GZY9.5
MSR 400 HR	28726-8	400	70	6.90	32,000	1000	6	92	6000	GZZ9.5
MSR 575 HR	28727-6	575	95	6.95	49,000	1000	7	90	6000	G22
MSR 1200 HR	24582-9	1200	100	13.80	110,000	1000	10	95	6000	G38
MSR 2500 HR	24581-1	2500	115	25.60	240,000	500	14	95	6000	G38
MSR 4000 HR	24589-4	4000	200	27.50	380,000	500	20	91	6000	G38
MSR 6000 HR	36042-0	6000	125	55.00	570,000	300	24	95	6000	GY38
MSR 12,000 HR	39071-6	12,000	160	84.00	1,200,000	300	30	95	6000	GY38
MSR 18,000 HR	21823-0	18,000	225	77.60	1,650,000	300	35	90	6000	GX51
Standard[1]										
MSR 400	24507-6	400	70	6.90	32,000	1000	6	95	5900	GX9.5
MSR 575/2 10H	28707-8	575	95	6.95	49,000	1000	7	70	7200	GX9.5
MSR 700	24542-3	700	72	12.00	55,000	1000	7	75	5900	G22
MSR 700/2	24543-1	700	72	11.00	55,000	1000	8	80	7200	G22
MSR 1200	24551-4	1200	100	13.80	110,000	800	10	80	5900	G22
MSR 1200/2	24556-3	1200	90	13.80	110,000	800	10	85	7200	G22
Short Arc[1]										
MSR 400 SA	24500-1	400	54	8.40	30,000	750	3	75	5600	GY9.5
MSR 700 SA	28712-8	700	72	11.00	55,000	750	4	80	5600	GY9.5
MSR 1200 SA	28687-2	1200	100	13.80	96,000	750	7	80	6000	GY22
MSR 1200 SA/SE Gold	24576-1	1200	93	15.00	93,000	750	7	80	6000	PGJ41
MSR 2000 SA	24541-5	1800	110	21.50	174,000	750	7	89	6000	GY22
MSR Lamps Double-Ended Gas Discharge [1]										
MSR 1800 DE	22058-2	1800		20.00	145,000	750	10	85	6000	SFC 15.5-6

1) Based on cycle 3.5 hours on/0.5 hour off, nominal wattage. Shorter life at short cycle operation.

2) Lamps must be used in fixtures designed for hot restrike.

* Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not

For the most current product information, go to the e-catalog on **www.philips.com**



MSR 125 HR, MSR 200 HR MSR 250 HR, MSR 400 HR | MSR 575 HR | MSR 1200 HR | MSR 2500 HR MSR 4000 HR | MSR 6000 HR MSR 12,000 HR | MSR 18,000 HR | MSR 400 SA MSR 700 SA | MSR 1200 SA MSR 2000 SA | MSR 1800DE

Specialty Lamps

MSR, MSD, MHD and MSI Lamps

Description	Product Number	Watts	Volts	Lamp Current (Amps)	Initial Lumens	Rated Avg. Life (Hrs.)*	Arc Length (mm.)	CRI	Color Temp (K)	Base	MOL (mm)
MSR SA/DE Gold (Double-Ended) Lamps											
MSR Gold 575 SA/2 DE	24501-9	575	94	7.1	42,000	750	5	75	7500	SFC 11	92
MSR Gold 700 SA/2 DE	28713-6	700	70	11.5	56,000	750	4	75	7500	SFC 10-4	136
MSR Gold 1200 SA/DE	28714-4	1200	100	13.6	110,000	750	7	85	6000	SFC 10-4	136
MSR Gold 1200 SA/2 DE	28725-0	1200	207	13.6	103,000	750	7	85	7500	SFC 10-4	136
MSR Gold 1510 SA/DE	28716-9	1500	207	13.5	140,000	750	7	88	6000	SFC 10-4	136
MSD Lamps (1)											
MSD 150/2	24516-7	150	96	1.85	10,500	3000	5	62	8500	G12	—
MSD 200	24511-8	200	70	3.40	13,500	2000	5	80	6000	GY9.5	—
MSD 250	24514-2	250	90	3.00	18,000	3000	5	75	6700	GY9.5	—
MSD 250/2 30H	28703-7	250	90	3.00	18,000	3000	5	70	8500	GY9.5	—
MSD 575	24519-1	575	95	6.95	43,000	3000	8	75	6000	GX9.5	—
MSD 575 HR (2)	24547-2	575	95	6.95	46,000	2000	8	75	6000	G22	—
MSD 700	24553-0	700	72	11.00	50,500	3000	10	75	6000	G22	—
MSD 1200	24558-9	1200	115	13.80	92,000	3000	14	80	6000	G22	—
MSI Lamps											
MSI 575 HR/2	21824-8	575	—	7.00	47,000	750	7	80	7800	SFC10-4	138
MSI 575 HR	39072-4	575	—	7.00	49,000	750	7	80	6000	SFC10-4	138

1) These lamp types must be operated with a separate rapid acting High Breaking-Capacity fuse, either 415V AC or 500V DC working in accordance with the supply in use as per end of table.
2) C.C.=coiled coil, S.C.=single
* Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not
Unless otherwise noted all dimensions are in inches. To convert inches to millimeters multiply by 25.4001.

For the most current product information, go to the e-catalog on **www.philips.com**


MSR SA/DE GOLD Lamps SFC 10-4 Base


MSR Gold Fastfit Lamp PGJX28 Base


MSR Gold Fastfit Lamp PGJX50 Base


MSD Lamp GY9.5 Base


MSD Lamp GX9.5 Base


MSD Lamp G22 Base


MSI Lamp SFC10-4 Base

Specialty Lamps

FastFit and Platinum Lamps

Description	Product Number	Watts	Volts	Lamp Current (Amps)	Initial Lumens	Rated Avg. Life (Hrs.)*	Arc Length (mm.)	CRI	Color Temp (K)	Base	MOL (mm)
FastFit Lamps											
Gas Discharge											
MSR Gold 300/2 Mini FastFit	28717-7	300	96	3.80	23,000	750	5.0	80	8300	PGJX28	126.0
MSD Gold 300/2 MiniFastFit	24538-1	300	96	3.80	21,000	2000	5.0	70	8600	PGJX28	126.0
MSR Gold 400 MiniFastFit	24896-3	400	55	7.20	26,000	750	3.0	60	6700	PGJX28	111.0
MSR Gold 575/2 Mini FastFit	28720-1	575	57	10.20	38,600	750	3.5	70	7500	PGJX28	112.0
MSR Gold 700/2 Mini FastFit	28692-2	700	69	10.20	47,000	750	5.0	75	7200	PGJX28	112.0
MSR Gold 700/1 MiniFastFit	29106-2	700	69	10.20	54,000	750	4	75	5600	PGJX28	112
MSR Gold 700 Mini FastFit	27709-5	700	69	10.90	50,000	750	4.0	73	6000	PGJX28	116.0
MSR Gold 700 FastFit	28691-4	700	207	10.20	50,000	750	4.0	80	6000	PGJX50	111.0
MSR Gold 700/2 FastFit	24562-1	700	72	10.20	50,000	750	4.0	75	7500	PGJX50	111.0
MSR Gold 1200 FastFit	28688-0	1200	207	15.00	95,000	750	5.0	80	6000	PGJX50	128.0
MSR Gold 1500 FastFit	28697-1	1500	198	15.30	120,000	750	6.0	80	6000	PGJX50	128.0
MSR Gold 2000/2 FastFit	24560-5	2000	110	19.00	160,000	750	8.0	88	7500	PGJX50	134.0
MSR Gold 2000 SA FastFit	24573-8	2000	110	19.00	165,000	750	8.0	80	6000	PGJX50	134.0
MSR Gold 2500/2 FastFit	28701-1	2500	135	19.53	193,000	750	9.5	85	7200	PGJX50	153.0
Fast Fit Hi-Brite Halogen											
Hi-Brite 750 FastFit	20161-6	750	80	9.50	22,500	300		100	3250	PGJX50	125.0
Hi-Brite 1200 FastFit	20162-4	1200	80	15.00	36,000	200		100	3250	PGJX50	140.0
7019G 750W PGJ X50	22907-0	750	115	6.52	20,500	300	9.5 x 9.0	100	3200	PGJX50	140.0
7018G 800W PGJ X50	22909-6	800	230	3.48	20,000	200	9.0 x 12.5	100	3200	PGJX50	140.0
7021G/LL 575W/115	27166-8	575	115	5.11	12,400	1500	9.0 x 9.5	100	3000	PGJX50	140.0
7024G 600W PGJ X50	27716-0	600	230		12,000	1500		100	2900	PGJX50	140.0
Platinum Lamps											
MSD Platinum 5R	24988-8	150–190	75		7950	2000	1.0	75	8000		57.1
MSD Platinum 15R	27608-9	264–300	75		13,500	2000	1.3	75	8000		66.4
MSD Platinum 16R	29305-0	330	75		16,000	1500	1.3	75	8000		66.4
MSR Platinum 35	24597-7	800	67		54,500	1000	3.0	73	7750	PGJX36	116.0
MSR Platinum 35 ST	29315-9	800	74		54,500	750	3.0	80	6000	PGJX36	116.0

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For the most current product information, go to the e-catalog on **www.philips.com**



MSR Gold Fastfit Lamp PGJX28 Base



MSR Gold Fastfit Lamp PGJX50 Base



MSD Platinum Lamps



Hi-Brite Fastfit Lamp PGJX50 Base

Specialty Lamps

Sealed Beam, Ceramic ST, Short Arc and Fluorescent Lamps with Super Actinic Radiation

Product Number	Watts	Description	Volts	Base	Diam. (In.)	Diam. (mm)	MOL (In.)	MOL (mm)	Lumens	Rated Avg. Life (Hrs.)*	Color Temp. (K)	Burning Position	Beam Shape
Sealed Beam													
27357-3	300	300PAR56/NSP	240	Mog. End	7	178	5	127		2000	3000	Universal	Narrow Spot
27356-5	300	300PAR56/MFL	240	Mog. End	7	178	5	127		2000	3000	Universal	Med. Flood
27358-1	300	300PAR56/WFL	240	Mog. End	7	178	5	127		2000	3000	Universal	Wide Flood
35619-6	500	500PAR56Q/NSP	120	Mog. End	7	179	5	127	88,000	4000	2950	Universal	Narrow Spot
35621-2	500	500PAR56Q/MFL	120	Mog. End	7	179	5	127	43,000	4000	2950	Universal	Med. Flood
35620-4	500	500PAR56Q/WFL	120	Mog. End	7	179	5	127	22,500	4000	2950	Universal	Wide Flood
27360-7	1000	1000PAR64/VNSP	240	Mog. End	8	204	6	150		300	3200	Universal	Very Narrow Spot
27361-5	1000	1000PAR64/NSP	240	Mog. End	8	204	6	150		300	3200	Universal	Narrow Spot
27362-3	1000	1000PAR64/MFL	240	Mog. End	8	204	6	150		300	3200	Universal	Med. Flood

Description	Product Number	Watts	Volts	Lamp Current (Amps)	Initial Lumens	Rated Avg. Life (Hrs.)*	Arc Length (mm)	CRI	Color Temp (K)	Base
Ceramic ST Lamps										
Ceramic ST 250HR	24517-5	250	100	2.6	23,000	4000	8	90	3200	GZY9.5

Product Number	Description	Watts	Volts	Lumens	Base	LCL (In.)	MOL (In.)
Short Arc Lamps[1]							
38278-8	CDM-SA/R 150W/942	150	96	—	G12	2.2	4
36039-6	CDM-SA/T 150W/942	150	96	14,000	G12	2.2	4

Product Number	Description	Watts	Current Amps	Bulb	Nom. Length (mm)	(In.)
Fluorescent Lamps with Super Actinic Radiation—Medium BiPin Base						
30808-0	TL140W/03	140	1.46	T12	1514	60

1) DC operation only—should be operated on a control circuit which supplies direct current to the lamp.

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Unless otherwise noted all dimensions are in inches. To convert inches to millimeters multiply by 25.4001.

For the most current product information, go to the e-catalog on **www.philips.com**



PAR56
Mog. End Base

Ceramic ST 250 HR
GZY9.5 Base

Ceramic ST 250
Mini FastFit
PGJX28 Base

SAH 250 B

TL
TLK

Specialty Lamps

UVA 365nm Peak Lamps

Product Number	Ordering Code	Watts	Description	Nom. Length (In.)	Bulb	Base	Rated Avg. Life (Hrs.)*	UVA Watts
UVA 365nm Peak Lamps(1)								
15765-1	PL-S 9W/10/2P (Lead Free)	9	UVA Lamp	6½	PL-S	G23	9000	
13034-4	PL-L 18W/10	18	UVA Lamp	9	PL-L	2G11	5000	3.4
23293-4	PL-L 36W/10/4P	36		15⅛	PL-L	2G11	2000	
28504-9	PL-L 36W/10/4P SECURA	36	UVA Lamp		PL-L		2000	
24675-1	TLK 40W/10R	40	UVA Reflector Lamp	24	T12	Med. Bipin	3000	7.4
26169-3	TL 60W/10R	60	UVA Reflector Lamp	48	T12	Med. Bipin	1000	15.8
26885-4	TL 80W/10R	80	UVA Reflector Lamp	60	T12	Med. Bipin	1000	20.5
24694-2	TL 100W/10R	100	UVA Reflector Lamp	70	T12	Med. Bipin	1000	26.6
21513-7	Actinic BL 8W/10	8	UVA Lamp	20	T5	Min. Bipin	3000	
21517-8	Actinic BL 30W/10	30	UVA Lamp	24	T8	Med. Bipin	2000	
39153-2	Actinic BL 40W/10	40	UVA Lamp	48	T12	Med. Bipin	9000	9.0
21518-6	Actinic BL 15W/10 SECURA	15	UVA Lamp	18	T8	G13	8000	3.0
13036-9	Actinic BL TL-D 15W/10	15	UVA Lamp	18	T8	Med. Bipin	5000	3.1
28670-8	Actinic BL TL-D 18W/10	18	UVA Lamp	24	T8	G13	13,000	5.0
28671-6	MASTER Actinic BL TL-D 18W/10	18	UVA Lamp	24	T8	G13	13,000	5.1
28386-1	MASTER Actinic BL TL-D 15W/10	15	UVA Lamp	18	T8	G13	8000	3.9
28578-3	MASTER Actinic BL TL-D 15W/10 Secura	15	UVA Lamp	18	T8	G13	8000	3.15
28573-4	MASTER Actinic BL PL-L 36W/10/4P	36	UVA Lamp		PL-L			
28672-4	Actinic BL TL-DK 36W/10	36	UVA Lamp	24	T8	G13	9000	8.8

* Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not

1) For graphic arts, lacquer curing and insect trap applications

For the most current product information, go to the e-catalog on **www.philips.com**



PL-S UVA Lamp | PL-L UVA Lamp | T12 Black Light Med. Base | TLK UVA Reflector Lamp | T8 Actinic UVA Lamp Med. Bipin | T12 Actinic UVA Lamp Med. Bipin

Product Number	Description	Watts (1)	UV-C Watts (2)(4)	Bulb	Base	Rated Avg. Life (Hrs.)*	Nom. Length (In.)	Volts
Germicidal Sterilamp 254nm Lamps								
Hot Cathode								
36371-3	TUV 4T5	4	0.9	T5(3)	Min. Bipin	6000	6	
24485-5	TUV 6T5	6	1.5	T5(3)	Min. Bipin	9000	9	
29930-5	TUV 8T5	8	2.4	T5(3)	Min. Bipin	11,000	12(3)	
30864-3	TUV 15T8	15	4.7	T8	Med. Bipin	8000	18(3)	
11250-8	TUV 16T5	15	4.0	T5(3)	Med. Bipin	11,000	12	
13340-5	TUV 17T8	17	4.5	T8	Med. Bipin	9000	25(3)	
29268-0	TUV 25T8	25	7.0	T8	Med. Bipin	8000	18(3)	
36016-4	TUV 30T8	30	11.2	T8	Med. Bipin	8000	36(3)	
26269-1	TUV 36W	36	15.3	T8	Med. Bipin	8000	48(3)	
37634-3	TUV 55W HO	55	17.5	T8	Med. Bipin	8000	48(3)	
29090-8	TUV 75W HO	75	26.0	T8	Med. Bipin	8000	48(3)	
Amalgam XPT Lamps								
24262-8	TUV 130W XPT	140	48.0(4)	T6	4PSE	12,000	33.14	67
24261-0	TUV 180W XPT	180	60.0(4)	T6	4PSE	12,000	40.63	90
24260-2	TUV 200W XPT	200	66.0(4)	T6	4PSE	12,000	45.16	94
24258-6	TUV 325W XPT HO	325	110.0(4)	T6	4PSE	12,000	62.28	160
28796-1	TUV 800W XHO SE	800	273(4)	T6	4PSE	12,000	70.51	103
Amalgam XPT Lamp Driver								
24266-9	TUV 130W XPTdriver							
24264-4	TUV 200W XPTdriver							
24263-6	TUV 325W XPT HO driver							
Amalgam Dynapower Lamps								
21256-3	TUV 230W XPT	230	78.0	T8	4-Pin	12,000		
21258-9	TUV 335W XPT	335	100.0	T10	4-Pin	12,000		
15792-5	TUV 260W XPT DIM	260	87.0	T10	4-Pin	12,000		
Dynapower Driver								
27885-3	Philips Dynapower							

* Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not

1) Wattages shown are for operation from a transformer or ballast, currently standard, under specified test conditions

2) 100 Hour

3) Approximate overall length including two standard lamp holders.

4) UVC 100 Hour on HF gear

For the most current product information, go to the e-catalog on **www.philips.com**



T5 Hot Cathode Lamp Min. Bipin



T8 Hot Cathode Lamp Med. Bipin



T10 4-Pin Amalgam Lamp



TUV Amalgam XPT System

Specialty Lamps

Germicidal Sterilamp 254nm Lamps

Product Number	Description	Watts (1)	UV-C Watts (2)(3)	Bulb	Base	Rated Avg. Life (Hrs.)*	Nom. Length (In.)	Volts
Germicidal Sterilamp 254nm Lamps								
Twin Tube PL-S / PL-L Hot Cathode								
38186-3	PL-S 5W/TUV	5	1.0	PL-S	G23	8000	4	
32512-6	PL-S 9W/TUV	9	2.3	PL-S	G23	9000	6½	
21064-1	PL-L 18W/TUV	18	5.5	PL-L	2G11	9000	8 15/16	
13726-5	PL-L 35W/TUV	35	11.0	PL-L	2G11	9000	8 15/16	
26585-0	PL-L 36W/TUV	36	12.0	PL-L	2G11	9000	16 7/16	
29464-5	PL-L 55W/TUV	55	17.0	PL-L	2G11	9000	22½	
13035-1	PL-L 60W/TUV	60	19.0	PL-L	2G11	9000	16 7/16	
13725-7	PL-L 95W/TUV	95	27.0	PL-L	2G11	9000	22½	
28566-8	TUV PL-S 9W/4P	9	2.2	PL-S	2G7	9000	6⅜	
28565-0	TUV PL-S 11W/2P	11	3.2	PL-S	G23	9000	9 3/16	
13502-0	TUV PL-S 13W/2P	13	3.4	PL-S	GX23	9000	7	
15127-1	TUV PL-L 24W/4P	24	7.0	PL-L	2G11	9000	12⅜	

* Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not

1) Wattages shown are for operation from a transformer or ballast, currently standard, under specified test conditions

2) 100 Hour

3) UVC 100 Hour on HF gear

For the most current product information, go to the e-catalog on **www.philips.com**



PL-S Twin Tube G23 Base

PL-L Hot Cathode 2G11 Base

Product Number	Description	Watts (1)	UV-C Watts (2)(3)	Bulb	Base	Rated Avg. Life (Hrs.)*	Nom. Length (In.)
TUV T5							
38542-7	TUV 11W 4P SE	11	2.6	T5	4-Pin	9000	10
38541-9	TUV 16W 4P SE	16	4.0	T5	4-Pin	9000	13
23061-5	TUV 20W 4P SE	20	6.0	T5	4-Pin	11,000	17
13341-3	TUV 25W 4P SE	25	8.0	T5	4-Pin	9000	20
29267-2	TUV 36T5 SP	40(4)	14.0	T5	Single Pin	9000	34
36209-5	TUV 36T5 4P SE	40(4)	14.0	T5	4-Pin	9000	34
13389-2	TUV 36T5 HO 4P SE	75	23.0	T5	4-Pin	9000	34
29269-8	TUV 64T5 SP	75	29.0	T5	Single Pin	9000	62
38303-4	TUV 64T5 4P SE IS	75	29.0	T5	4-Pin	9000	62
36217-8	TUV 64T5 4P SE	75	29.0	T5	4-Pin	9000	62
39200-1	TUV 64T5 HO 4P SE	140	45.0	T5	4-Pin	9000	62

* Rated Average Life is the length of operation (in hours) at which point 50% of a large sample of lamps will still be operational and 50% will not

1) Wattages shown are for operation from a transformer or ballast, currently standard, under specified test conditions.

2) 100 Hour

3) UVC 100 Hour on HF gear

4) Wattage shown is for lamp operating current of 420 ma. Wattage will vary at other operating currents as follows: 120 ma. — 17 watts; 200 ma. — 25 watts; 300 ma. — 32 watts.

For the most current product information, go to the e-catalog on **www.philips.com**



Slimline T5
TUV
4-Pin



Slimline T5
TUV
Single Pin



Slimline T5
TUV
Bipin

Specialty Lamps

Base Types and Bulb Shapes

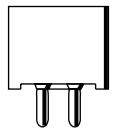
Base Types (Not Actual Sizes)



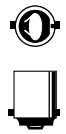
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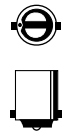
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IEC: 7004-92
ANSI: Recessed single contact base
C8.61-1990
sheet 1-770-1



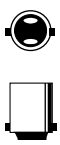
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IEC: 7004-73-2
ANSI: Miniature 2-pin
C81.61-1990
sheet 1-20-1



BA 15s
DIN: 49720
IEC: 7004-11A
ANSI: Single contact candelabra bayonet base
C81.61-1990
sheet 1-20-1



BA15d
DIN: 49720
IEC: 7004-11A
ANSI: Candelabra bayonet base double contact
C81.61-1990
sheet 1-20-1



B15d
DIN: 49721
IEC: 7004-11



B22d/22
IEC: 7004-10



G3.9
ANSI:
C81.61-1990
sheet 1-300-1



G4
IEC: 7004-72



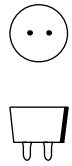
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(Round pin)
IEC: 7004-73
ANSI:
C61.61-1990
sheet 1-321-1



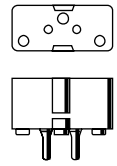
G6.35
GX6.35
GY6.35
IEC: 7004-59
ANSI: C81.61-1990
sheet 1-340-1



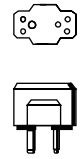
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IEC: 7004-59A



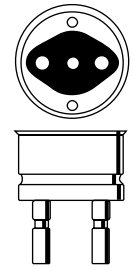
GZ4
IEC: 7004-67



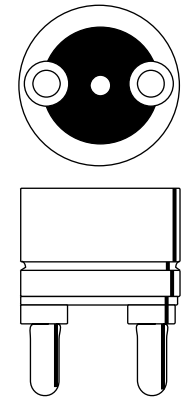
GX9.5
DIN: 49638
IEC: 7004-70A



GY9.5
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ANSI: C81.61-1990
sheet 1-369-1

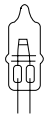


G22
IEC: 7004-75
ANSI: Medium bipost
C81.61-1990
sheet 1-466-1

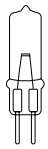


G38
IEC: 7004-76
ANSI: Mogul bipost
C81.61-1990
sheet 1-519-1

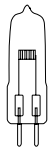
Bulb Shapes (Not Actual Sizes)



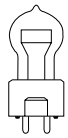
T-2.5
T-3



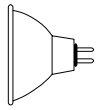
T-3.5
T-4
T-4.5



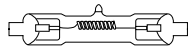
T-5
T-6



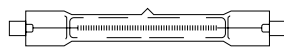
G-7



MR-11
MR-13
MR-16



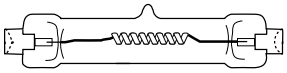
R7s



RX7s

Base Types and Bulb Shapes (Not Actual Sizes)

Double-Ended Tungsten Halogen lamps
3⅛, 3¾, 4⅜, 4¹¹⁄₁₆, 5⅝ and 6⅝ MOL
R7 Base

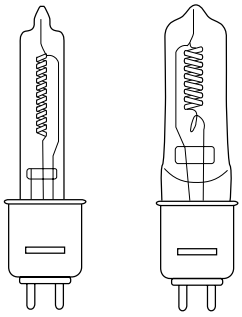


DWT, EME



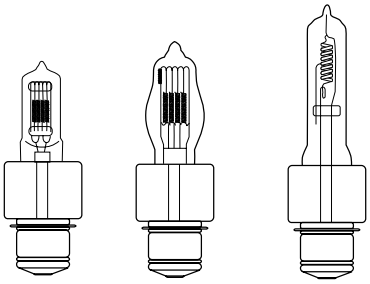
EKM, FDG, DXX

Medium 2-Pin
Tungsten Halogen Lamps (G9.5)



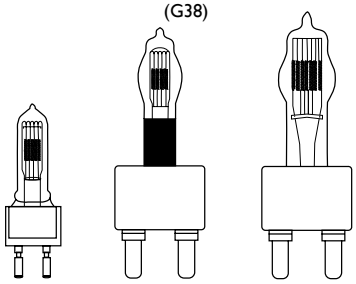
GLA FEL

Medium Prefocus Lamps with 2⁹⁄₁₆" L.C.L. (P28s)
Medium Prefocus Lamps with 3½" L.C.L. (P28s)



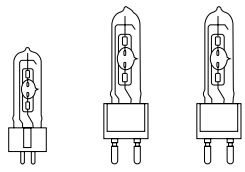
BTL BTN 6800C FKD

Medium Bipost Lamps with 2½" L.C.L. (G22)
Medium Bipost Lamps with 5" and 6½" L.C.L. (G38)



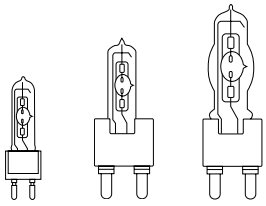
EGT CYV CYX FKK (5" LCL)

MSR Lamps
(Medium Source Rare Earth Lamps)



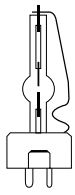
MSR 400 MSR 700 MSR 1200

MSR/HR Lamps (Medium Source Rare Earth Lamps Hot Restrike Version)



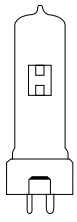
MSR 575/HR MSR 1200/HR MSR 2500/HR

MSR Short Arc Lamps



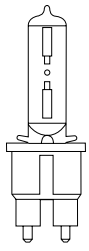
MSR 400W SA

MSD Lamps

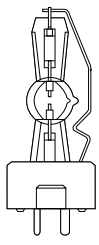


MSD 200W/2

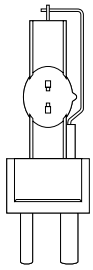
MHD Lamps



MHD 1800



MSR 400 SA/MSR 700 SA



MSR 1200 SA/MSR 2000 SA

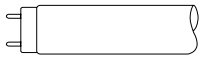
Specialty Lamps

Base Types and Bulb Shapes

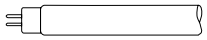
Specialty Bulb Shapes (Not Actual Sizes)



T12 Medium Bipin



T8 Medium Bipin



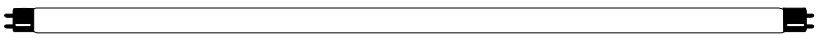
T5 Miniature Bipin



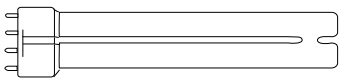
Hot Cathode Sterilamp



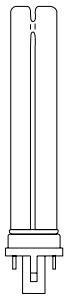
Cold Cathode and Slimline Sterilamp



Slimline Sterilamp

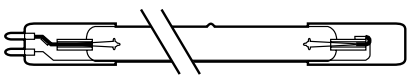


PL-L

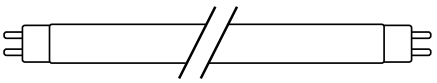


PL-S

XPT



Xtra



Accent Lighting
Concentrated light on a subject which highlights it and causes it to stand out from its surrounding. Depending on degree of drama desired, accent light should minimally be 10x the general light or ambient light.

Accommodation
The involuntary muscular process by which the eye changes focus from one distance to another.

Adaptation
The involuntary process by which the visual system changes its sensitivity, depending on the luminances prevailing in the visual field. The process involves both the iris and the light sensitive cells of the retina.

AlInGaP
The preferred LED (Light Emitting Diode) chip technology containing Aluminum, Indium, Gallium, and Phosphorous to produce red, orange and amber-colors.

ALTO Lamp Technology
Philips ALTO Lamp Technology is widely recognized as a leading low-mercury solution for fluorescent lighting. This technology uses capsule dosing to precisely control the amount of mercury in each ALTO lamp. Long-life ALTO lamps further reduce the need to replace lamps and, as a result, decrease the amount of mercury used over life of any lighting installation.

Ballast
The ballast is an electrical device that performs two basic functions: 1) provides the starting voltage and 2) limits the current to sustain lamp operation.

Ballast types for fluorescent lamps:

Instant Start: Instant start electronic ballasts are the most popular type of electronic ballast today because they provide maximum energy savings and they start lamps without delay or flashing. Since they do not provide lamp electrode heating, instant start ballasts consume less energy than comparable rapid start, program rapid start or programmed start ballasts. As a result, they provide the most energy efficient solution to fluorescent lamp ballasting. The instant start ballast uses 1.5 to 2 watts less energy per lamp than the rapid start alternative.

Instant-start electronic ballasts provide a high initial voltage (typically 600V for F32T8 lamps) to start the lamp. This high voltage is required to initiate discharge between the unheated electrodes of the lamp. However, the cold electrodes of lamps operated by an instant start ballast may deteriorate more quickly than the warmed electrodes of lamps operated by a rapid start, program rapid start or programmed start ballast. Lamps operated by instant start ballasts will typically withstand 10–15K switch cycles. Instant start ballasts are typically wired in *parallel*. This means that if one lamp fails, the other lamps in the circuit will remain lit.

Rapid Start: Rapid start ballasts have a separate set of windings which provide a low voltage (approx. 3.5 volts) to the electrodes for one second prior to lamp ignition. A starting voltage somewhat lower than that of instant ballast (typically 450–550V for F32T8 lamps) is applied, striking an electrical arc inside the lamp. Most rapid start electronic ballasts continue to heat the electrode even after the lamp has started, which results in a power loss of 1.5 to 2 watts per lamp. Lamps operated by a rapid start electronic ballast will typically withstand 15–20K switch cycles. Rapid start ballasts are typically wired in *series*. This means that if one lamp fails, all other lamps in the circuit will extinguish.

Programmed Start: Programmed start (PS) electronic ballasts provide maximum lamp life in frequent starting conditions (up to 50,000 starts). PS ballasts use a custom integrated circuit (IC) which monitors lamp and ballast conditions to ensure optimal system lighting performance. Like Program rapid start ballasts, PS ballasts also precisely heat the lamp cathodes. However, PS ballasts heat the lamp cathodes to 700°C prior to lamp ignition. This puts the least amount of stress on the lamp electrodes, resulting in maximum lamp life regardless of the number of lamp starts. Programmed start ballasts are typically wired in *series*.

Ballast types for HID lamps:

Reactor: Single coil, very efficient, but poor voltage regulation to the lamp.

Constant Wattage Autotransformer (CWA): Employing two coils, the ballast is less efficient then reactor types, but have better voltage regulation. Most popular type in use.

Magnetically Regulated (Mag Reg) or Regulated Lag (Reg Lag): Three coils make for very effective voltage regulation but also not very efficient.

Electronic: Allows for both high efficiency and the best voltage regulation.

Beam Angle
The beam angle defines the light pattern around the beam's central axis for which the luminous intensity is half that of the maximum luminous intensity.

Bin
In LEDs, the systematic dividing of distribution of performance parameters (Flux, Color or CCT, and Vf) in to smaller groups that meet aesthetic requirements of the assembly.

Binning
The separation of LEDs subsequent to a production run for full manufactured, distribution in terms of color, flux and forward voltage.

Candela (cd) (Luminous Intensity)
The intensity base unit for light. Intensity is the luminous flux emitted from a point per unit solid angle into a particular direction, regardless of distance.

Candlepower (cp)
Luminous intensity expressed in candelas.

Chip
A very small square of semi-conducting material. Also known as a die, it is the active light-emitting component of an LED.

Color Rendering Index (CRI)
A method for describing the effect of a light source on the color appearance of objects, compared to a reference source of the same color temperature (CCT). The highest CRI attainable is 100. Originally based on an eight standardized color comparisons, it was later extended to fourteen colors.

Additional Information

Glossary

Color Temperature or Correlated Color Temperature (CCT)
The color temperature of a light emitter refers to the temperature to which one would have to heat a "blackbody" source (Planckian radiator) to produce light of similar overall appearance or chromaticity. A low color temperature implies warmer color (more yellow/red) light while high color temperature implies a cooler light (more blue). The standard unit for color temperature measurement is expressed in Kelvin (K).

Die–Chip
heart of the LED

Diode
A two-electrode device with an anode and a cathode that passes current in only one direction. It may be designed as an electron tube or as a semiconductor device.

Driver
Electronics used to power illumination sources. Ballast.

Field Angle
The field angle defines the light pattern around the beam's central axis for which the luminous intensity is 10% that of the maximum luminous intensity.

Footcandle
The unit of measure for the density of light on a surface unique to the USA. One footcandle is equal to one lumen per foot (lm/ft^2). One footcandle = 10.674 lux.

General Lighting (Ambient Lighting)
Lighting designed to deliver a predominately uniform level of light throughout an area.

Glare
Glare is an interference with visual perception caused by an uncomfortably bright light source or reflection within one's field of view; a form of visual noise. In its simplest form, glare (unwanted light) is a consequence of the human eye to adapt to different light levels. In the case of glare, the eye adapts to the high level of the glare source, which makes it difficult to perceive details in the now too dark work area.

Direct Glare: Glare resulting from high luminances in the visual environment that are directly visible from a viewers position; such as an insufficiently shielded luminaire.

Reflected Glare or Veiling Reflection: A reflection of incident light that partially or totally obscures the details to be seen on a surface by reducing the contrast.

Discomfort Glare: Glare which is distracting or uncomfortable (subjective), which interferes with the perception of visual information, but which does not significantly reduce visual performance.

Disability Glare: The effect of light which significantly reduces visual performance and perception; such as car high beams in your face on a dark country road.

Illuminance
The total density of visible light—from all directions — illuminating, falling on or incident to, a surface. Standard unit of measure for illuminance is LUX (lx) which is lumens per square meter (lm/m^2). See Footcandle.

InGaN
The preferred LED (Light Emitting Diode) semiconductor technology containing Indium, Gallium, and Nitrogen to produce green, blue and white-colored LED light sources.

Initial vs. Mean Lumens
The measured luminous output of a new light source versus the output at 40% of lamp life.

Inverse Square Law
This law says that the measured flux density from a light source decreases along any line from the source. It falls off in proportion to the square of the relative distance traversed. Thus the illuminance measurement 2 feet from the light source will be ¼ of the measurement 1 foot from the source—not ½.

Kelvin
The Kelvin unit is the basis of all temperature measurement. In lighting, Kelvin is the unit of measure for Color Temperature used to indicate the overall color of the light produced from a source.
See Color Temperature.

Kilowatt Hour (kWh)
The measure of electrical energy from which electricity billing is determined. For example, at the rate of $0.11 per kWh, a 100 watt lamp operating for 2000 hours will cost $22.00 (100 x 2000/1000 = 200 kWh x .11 = $22.00)

LED Driver
See 'Driver'

Light
Radiant energy that stimulates the sense of sight. The "visible" part of the electromagnetic spectrum from 380–770 nm. Light is the energy which allows us to see.

Light Emitting Diode (LED)
A solid-state semiconductor device that converts electrical energy directly into light. On its most basic level, the semiconductor is comprised of two regions. The p-region contains positive electrical charges while the n-region contains negative electrical charges. When voltage is applied and current begins to flow, the electrons move across the n region into the p region. The process of an electron moving through the p-n junction releases energy. The dispersion of this energy produces photons with visible wavelengths.

Lumen (lm)
SI unit of luminous flux. Photometrically, it is the luminous flux emitted within a unit solid angle (lsr) by a point source having a uniform luminous intensity of 1 cd. —or— The SI unit for measuring the flux of light being produced by a light source or received by a surface.

Luminaire (light fixture)
A complete lighting unit which consists of lamp(s), ballast(s)—if applicable—as well as mechanism for light distribution, lamp protection and alignment and connection to power.

Luminaire Efficacy
The ratio of luminous flux emitted by the fixture to that emitted by the lamp(s) within the fixture. Expressed as a percentage.

Luminance (The physical measure of brightness)
Luminance is the amount of visible light leaving a point on a surface in a given direction. The light leaving the surface can be due to reflection, transmission and/or emission. Standard unit of luminance is candela per square meter (cd/m^2).

Luminous Efficacy
The expression of efficiency in converting power (watts) into light (lumens). Expressed as lumens per watt or l/w.

Luminous Exitance
Refers to the total amount of visible light leaving a surface in all directions. Unit for luminous exitance is lumens per square meter (lm/m^2)

Packaged LED
Consists of the die, a lead frame, which houses the die, the encapsulation epoxy that protectively surrounds the die, and also disperses the light.

Parallel (LED)
Electrical condition where LEDs operate under the same voltage being provided by a driver.

Photocell
A transducer used to detect and measure light and other radiations.

Photometry
Photometry is the science of measuring visible light in units that are weighted according to the sensitivity of the human eye known as the Visual Wavelength (Vλ) factor. Photometric theory does not address how we perceive colors.

Radiometry
Radiometry is the science of quantifying the phenomena of electromagnetic radiation. In our context, we are interested in light, the limited range of electromagnetic radiation that is visible to the human eye, sometimes extended to the areas of infrared and ultraviolet.

Rated Average Life
The length of operation (in hours) at which point an average of 50% of a large sample of lamps will still be operational and 50% will not.

Series (LED)
Electrical condition where LEDs operate under the same current being provided by a driver.

Task Lighting
Lighting designed for a specific visible operation which requires higher light levels; most often characterized by proximity to that task.

Transformer
An electrical device by which alternating current of one voltage is changed to another voltage

Voltage
A measure of electromotive force or simply said, the pressure of electricity. This is analogous to pressure in a water line. In this catalog, voltage refers to supply voltage required by the lamp (incandescent) or operating voltage required by the arc tube (discharge lamps).

Watt
Unit used to measure electric power consumed by a lamp or any electrical device.

Additional Information

Technical Descriptions

Lamp Listing Sequence

Lamps are listed in wattage sequence except for special groupings such as Street Lighting, Tungsten Halogen, High Intensity and Silicone Coated Lamps.

Ordering Code

The complete information shown in the ordering code column together with the voltage, if applicable, should be used when placing orders. In a number of instances a lamp type may be available in different kinds of packaging such as 2 or 4 lamp wrappers. Some small lamp types which are generally multiple packed on a platform with an overwrap are also packaged as a blister-carded item for the retail market. Each of these items is shown as a separate listing. To identify them, additional information is included with the ordering code. The following examples illustrate this:

Ordering Code	BC-7T7/W 12/2
Pkg. Qty.*	12cds
Explanation	Carded pack—2 lamps per card. The number shown under "Pkg. Qty" is the number of cards per min. shipping case.

Ordering Code	60T/SW 12/4
Pkg. Qty.	48
Explanation	12-4 lamp wrappers = 48 lamps per min. shipping case.

Ordering Code	50/150T/WL/TP 96/1
Pkg. Qty.	96
Explanation	96-1 lamp wrappers = 96 lamps per min. shipping case.

* Quantity shown is minimum shipping container. Refer to Net Price Schedule for number of lamps required for qualification as a standard case.

Voltage

Lamps listed are available only in the voltage shown. Lamps listed in range voltages such as 115–125 or 230–250 are intended for use on circuits normally varying within these voltage limits and are designed for an average voltage suitable for operation on such circuits. Lamps intended for operation in range voltages have a design volt center as follows, unless otherwise noted by a footnote:

Range Voltage	Design Voltage
115–125	120
120–125	120
120–130	125
125–130	130
230–250	240

Class of Lamp

Incandescent lamps are classified as type B or type C. The type B lamp is one in which the filament operates in a vacuum. The type C lamp is one in which the filament operates in an atmosphere of inert gas. For gas-filled lamps which can be operated in any position, the lumen maintenance is best when lamps are operated base up. For the vacuum type lamps which have no restrictions on operating position, the lumen maintenance is the same in all operating positions.

Lamp Dimensions

Bulb designations consist of a letter or letters to indicate shape and a number to indicate the approximate diameter in eighths of an inch.

Maximum Overall Length (MOL)

Maximum Overall Length is measured from the top of the bulb to bottom of the base.

Nominal Length

A measurement of fluorescent lamp length based on the length of the lamp plus the proper allowance for standard lamp holders.

Light Center Length (LCL)

Light Center Length is the distance from a reference point on a lamp base (usually the eyelet) to the center of the light source. For high intensity discharge lamps, it is the distance from the center of the filament or center of the arc to the point shown below for the base indicated.

All Screw Bases: Bottom base contact

Medium and Mogul Prefocus: Top of base pin

Medium Bipost: Bottom of bulb

Bayonet Candelabra and Medium Bayonet: Top of base pins

SC or DC Prefocus: Plane of locating bosses of prefocusing collar

Mini-Can: Intersection of 45° taper with max. diameter of base

Inches to Metric Conversion

To calculate the metric equivalent of inches in millimeters (mm) use the following formula: inches x 25.4001 = millimeters

Operating Position

Lamps may be operated in any position unless otherwise indicated.

Base Pin Position for Bayonet Candelabra-Based Lamps

When lamps are based with a bayonet candelabra base, the plane of the base pins will be approximately at right angles to the plane of the filament, unless otherwise indicated.

SC or DC Prefocus Based Lamps

The plane containing the base axis and the major locking eyelet, which is the eyelet equidistant from the two other eyelets, will be at right angles to the plane of the filament or lead wires unless otherwise indicated. The letter (A) shown in the Base column after SC or DC Pref. based lamps indicates that the distance from the bottom of base contact or contacts to the bottom of the collar is .406". In the case of DC Pref. based lamps, the letter (A) also indicates that the plane containing the base axis and contacts is at right angles to the plane containing the base axis and the major locking eyelet.

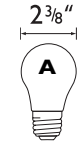
Additional Information

Measuring Lamps and Understanding Ordering Codes

Measuring Incandescent, Halogen, CFL and HID Lamps

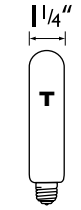
Letters designate the shape of the glass bulb and numbers indicate the diameter of the bulb in eighths of an inch. For example:

"A19" indicates a standard bulb having a diameter of 19/8 or 2 3/8 inches.



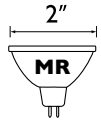
A19 Lamp

"T10" indicates a tubular shaped having a diameter of 10/8 or 1¼ inches.



T10 Lamp

"MR16" indicates mini reflector having a diameter of 16/8 or 2 inches.



MR16 Lamp

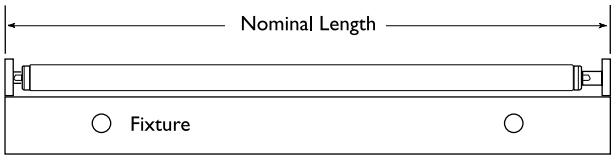
"ED37" indicates a large HID bulb having a diameter of 37/8 or 4 5/8 inches.



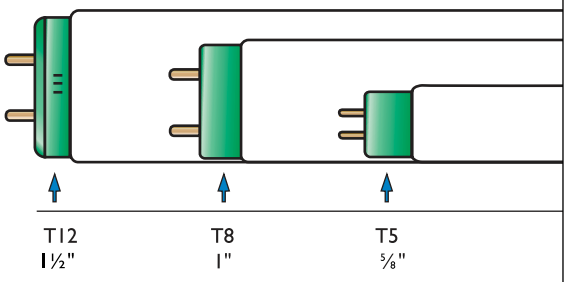
ED37 Lamp

Measuring Fluorescent Lamps

To determine the length of a fluorescent lamp, you do not measure the bulb. The Nominal Length of the bulb is the measurement from back of socket to back of socket on the fixture.



To determine the type of lamp you need, measure the endcap and use the illustration below as a guide.



Understanding Ordering Codes

Typical ordering codes can be understood with the examples below:

Incandescent ordering code: BC15BA9C/CL/LL

BC = Blister Carded Package
15 = Lamp Wattage
BA9 = Lamp Type
C = Candelabra Base (Blank = Medium)
CL = Clear (W = White, etc.)
LL = Long Life (Blank = Standard)

Halogen ordering code: 45PAR38/HAL/SP10

45 = Lamp Wattage
PAR38 = Lamp Type
Hal = Halogen
SP = Spot Lamp
10 = Beam Spread in Degrees

CFL ordering code: PL-C 13W/827/4P/ALTO

PL-C = Lamp Type
13W = Lamp Wattage
827 = Lamp Color
4P = Base has 4-Pins
ALTO = Low Mercury Content

Fluorescent ordering code: F32T8/ADV841/ALTO

F = Fluorescent
32 = Nominal Lamp Wattage
T8 = 1" Diameter Tube
ADV = Advantage
841 = CRI of 80+ and Color Temp. of 4100K
ALTO = Low Mercury Content

HID ordering code: MS320/C/U/PS

MS = High Output Arc Tube
320 = Lamp Wattage
C = Coated
U = Universal Burning Position
PS = Pulse Start

Notes

Notes

Notes

Notes



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SG-100 08/13

Philips Lighting Company
A Division of Philips North America
200 Franklin Square Drive
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Phone: 800-555-0050

Philips Lighting Company
A Division of Philips Canada
281 Hillmount Road
Markham ON, Canada L6C 2S3
Phone: 877-744-5633

Low voltage
Direct Current Network

Compact NSX DC
Masterpact NW DC

Power circuit breakers and switch-disconnectors
direct current from 16 to 4000 A

Catalogue
2012







Schneider Electric

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Compact NSX and Masterpact NW direct current

A complete DC offer from 16 to 4000 A

Compact NSX and Masterpact NW direct-current (DC) circuit breakers are used to protect and control low-voltage distribution systems.

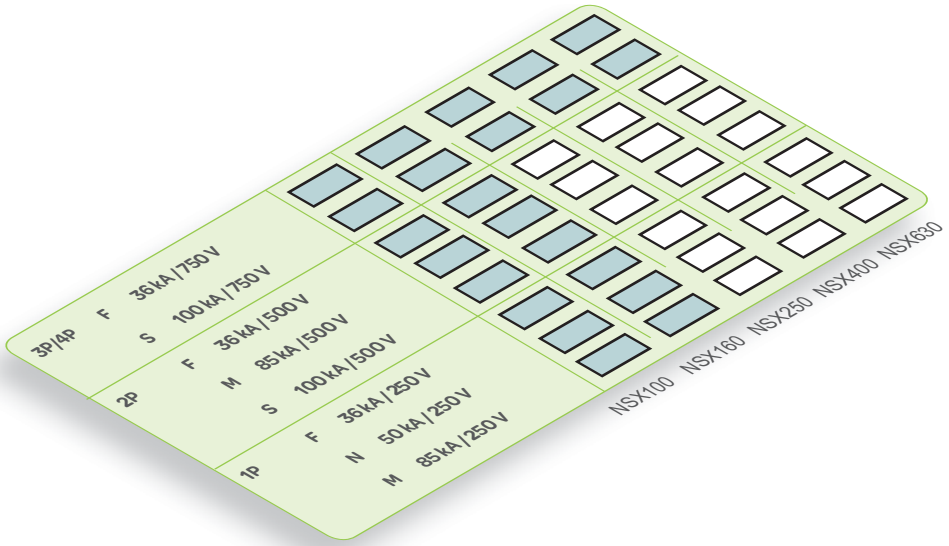
They are installed in main low-voltage switchboards (MLVS) and in distribution switchboards (as incomers and outgoers). They can use all the accessories and auxiliaries for the AC ranges and are thus suitable for most DC systems and applications.



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A complete DC offer

Compact NSX 16 to 630 A DC



The Compact NSX range is designed for DC voltages from 24 to 750 V and offers:
■ a wide selection of models suited to many applications:
□ 1, 2, 3 and 4 poles up to 160 A
□ 3 and 4 poles from 250 to 630 A
■ high breaking capacities, with four performance levels F, N, M and S:
□ F
- 36 kA in a 1 pole version, for systems ⩽ 250 V
- 36 kA in a 2 poles version, for systems ⩽ 500 V
- 36 kA in a 3 or 4 poles version, for systems ⩽ 750 V

□ N
- 50 kA in a 1 pole version, for systems ⩽ 250 V

□ M
- 85 kA in a 1 pole version, for systems ⩽ 250 V
- 85 kA in a 2 poles version, for systems ⩽ 500 V

□ S
- 100 kA in a 2 poles version, for systems ⩽ 500 V
- 100 kA in a 3 or 4 poles version, for systems ⩽ 750 V

■ fewer frame sizes: just two poles pitches (35 and 45 mm) for easy integration in installation systems (enclosures, machines, etc.)
■ accessories for insulation and series or parallel connection of poles, suited to the particularities of DC applications
■ fixed and withdrawable versions (3 and 4 poles, DC type).

Breaking capacity Icu for 250 V per pole and L/R = 15 ms (1)
(1P: 250 V, 2P: 500 V, 3P: 750 V)

(1) L/R = time constant of the distribution system (see page A-60).


NSX250 DC -1P.


NSX160 DC - 2P.

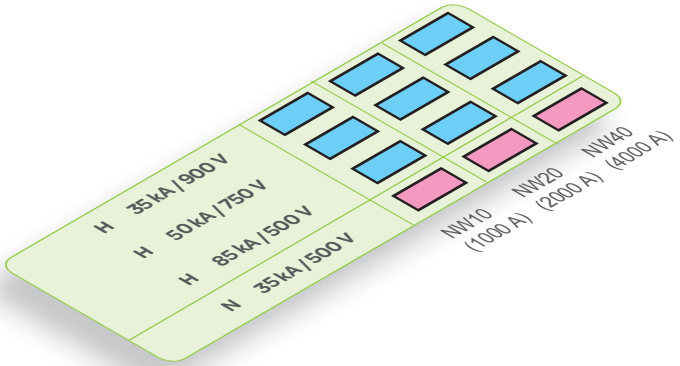

NSX250 DC - 3P.


NSX630 DC - 3P.

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from 16 to 4000 A

Masterpact NW 1000 to 4000 A DC



The Masterpact NW range is designed for DC voltages from 24 to 900 V and offers:

- 2 versions : C/D (3 poles)
  E (4 poles)
- three current ratings: 1000, 2000 and 4000 A
- two high breaking-capacity levels N and H.

Breaking capacity Icu for L/R = 15 ms (1) for 500, 750 or 900 V system voltages:

- N
  - 35 kA for systems ≤ 500 V
- H
  - 85 kA for systems ≤ 500 V
  - 50 kA for systems ≤ 750 V
  - 35 kA for systems ≤ 900 V
- two models:
  - circuit breaker for the protection of power circuits and loads
  - switch-disconnector for circuit control and disconnection
- fixed and drawout versions for the entire range.

(1) L/R = time constant of the distribution system (see page A-60).



NW10 DC - C/D Version.



NW10 DC - E Version.

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General contents

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Electrical diagrams D-1

Additional characteristics E-1

Catalogue numbers and order form F-1

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The advantages of comprehensive and optimised range design...

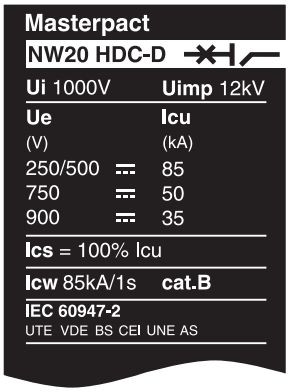
Compact NSX and Masterpact NW DC circuit breakers constitute a flexible and cost-effective means to meet the various needs of DC systems.

DB403581.eps



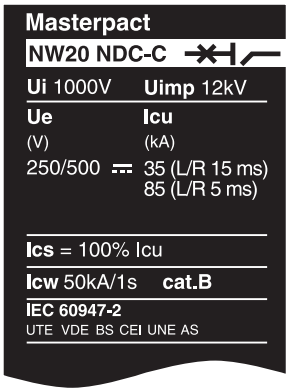
NSX250 DC rating plate.

DB104462.eps



NW20 HDC-D rating plate.

DB104463.eps



NW20 NDC-C rating plate.

A wide, complete and high-performance range

Schneider Electric DC circuit breakers provide a comprehensive solution for the many applications found in DC systems.
The Compact NSX and Masterpact NW ranges offer, for the common voltages and pole versions, a wide selection of current ratings (16 to 4000 A) and breaking capacities (up to 100 kA).

Flexible and optimised design

The Compact NSX and Masterpact NW DC ranges use all the standard accessories and auxiliaries of the AC ranges.
The modular design and many possibilities offered by these systems provide a high degree of flexibility in personalising products, while benefiting from dependable and optimised industrial design.

Safe and simple operation

Even though they use the accessories of the corresponding AC ranges, the Compact NSX and Masterpact NW DC ranges have been specially designed for DC systems.
Specific accessories have been developed to meet the needs of series or parallel connection of poles by users in a simple and dependable manner (see page opposite).
Compact NSX and Masterpact NW DC devices can be installed in class II switchboards with a degree of protection up to IP54.

Compliance with standards

Schneider Electric DC circuit-breaker ranges comply with :
- the main international standards and in particular IEC 60947-1/2/3/4/5,
- European (EN 60947-1 and EN 60947-2) and the corresponding national standards: France NF, Germany VDE, UK BS, Australia AS, Italy CEI,
- the specifications of the marine classification companies (Veritas, Lloyd's Register of Shipping, Det Norske Veritas, etc.)
- French standard NF C 79-130 and the recommendations issued by the CNOMO organisation for the protection of machine tools. For United States UL, Canadian CSA, Mexican NOM and Japanese JIS standards, please consult us.

Open communication

Compact NSX and Masterpact NW DC devices can be equipped with communication options for integration in a supervision system via Modbus/JBus bus.

Pollution degree

Compact NSX and Masterpact NW DC circuit breakers are certified for operation under pollution conditions in industrial environments, as per standard IEC 60947, corresponding to:
- pollution degree 3 (Compact NSX)
- pollution degree 4 (Masterpact NW).

Tropicalisation

Compact NSX and Masterpact NW DC circuit breakers have successfully passed the tests prescribed by the following standards for extreme atmospheric conditions:
- IEC 60068-2-1 - dry cold (-55 °C)
- IEC 60068-2-1 - dry heat (+85 °C)
- IEC 60068-2-30 - damp heat (95 % relative humidity at +55 °C)
- IEC 68-2-52 (level 2) - salt mist.

Environmental protection

Schneider Electric circuit-breaker ranges benefit from Eco-design:
- use of materials not representing a danger to the environment
- non-polluting production units complying with ISO 14001 standards
- filtered breaking for high current ratings to avoid pollution in the switchboard
- low dissipated energy per pole, making energy losses insignificant
- marking of products in view of sorting recyclable materials at the end of the service life.

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... specifically for DC applications

Compact NSX and Masterpact NW DC circuit breakers offer optimised pole-connection possibilities.

Designed for direct current

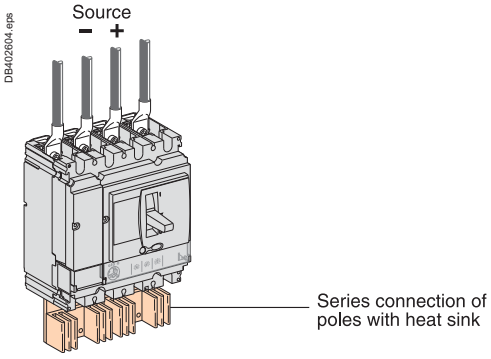
Performance levels and quality signed Schneider Electric

The creation of a dependable and high-performance DC range requires a large amount of specific design and development work in addition to that invested in the original AC range.
Schneider Electric called on its proven industrial experience in the AC field and its recognised know-how in current interruption to develop a high-performance DC range.
Schneider Electric decided to use the cases and accessories of its Compact NSX and Masterpact NW ranges with:
- a high-performance design for the breaking chambers or the poles intended specifically for DC applications (e.g. 100 kA at 250 V per pole for Compact NSX and 85 kA at 900 V for two poles for Masterpact NW)
- fast trip units developed for DC applications
- optimised pole-connection and isolation possibilities that are both simple and dependable.

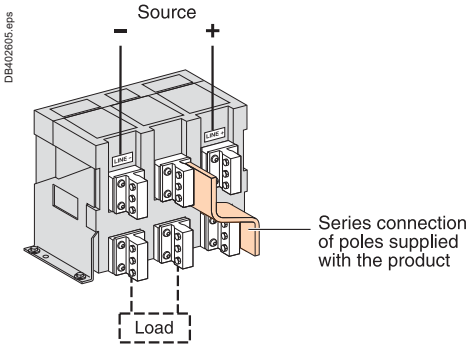
Optimised solutions for the many types of DC systems

The many types of DC systems make it necessary, for cost and technical-optimisation reasons, to connect the poles of two, three or four-pole circuit breakers in series or in parallel.
- The Compact NSX and Masterpact NW ranges enable series connection of poles, thereby optimising breaking capacity for high voltages.

Series connection reduces the voltage across the terminals of each pole (the total voltage is divided by two, three or four depending on the circuit breaker) and the operation of all poles provides the breaking capacity of the overall device.
This makes it possible to break short-circuit currents at high voltages while optimising solutions (e.g. a Compact NSX 100 kA 250 V per pole can be used on a 750 V system with three poles connected in series, thus reducing the cost compared to a 750 V solution.
- The Compact NSX range enables parallel connection of the poles, thereby optimising the use of the rated currents.



Compact NSX DC - safety and flexibility.



Masterpact NW DC - supplied ready for installation (here with vertical rear connections).

Optimised and dependable series or parallel connection of poles

Series connection - controlled temperature rise and guaranteed performance

Schneider Electric DC circuit breakers comply with product standards IEC 60947-1 and 2.
To that end, series connection of poles meets:
- temperature-rise conditions. Connections specifically designed to dissipate heat mean the thermal model is equivalent to that for AC applications. The devices dissipate the temperature rise produced by relatively short series connections
- optimum safety conditions. Connections are designed for extreme operating conditions (insulation and safety clearances, ultimate breaking capacity, high pollution levels, etc.).

Parallel connection - optimisation

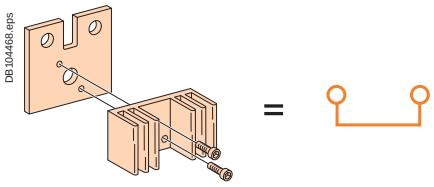
Certain DC systems require high power levels (hundreds to thousands of amperes) at reduced voltages, most often ⩽ 250 V.
The configurations of DC systems and the exceptional performance levels of Compact NSX circuit breakers mean the poles can be parallel connected. This technique virtually doubles, triples or quadruples the current rating depending on the type of circuit breaker and thus reduces the cost of solutions.

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Great flexibility in adapting to DC applications

Overview of series connection of poles for Compact NSX DC

With Compact NSX DC circuit breakers, it is easy to create a large number of series pole arrangements using prefabricated connections mounted on site during equipment installation.

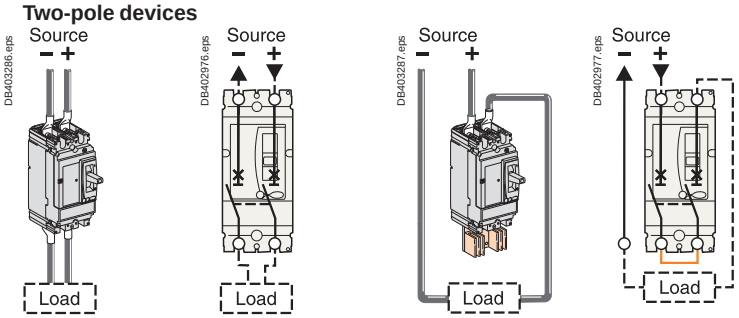


One type of connection per framesize, two catalogue numbers for all series connections.

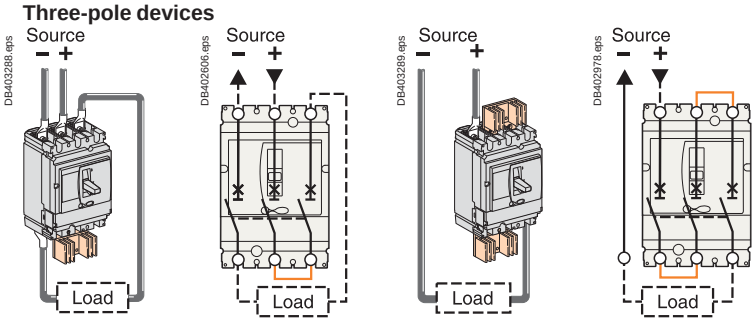
Compact NSX DC

Examples of series connection

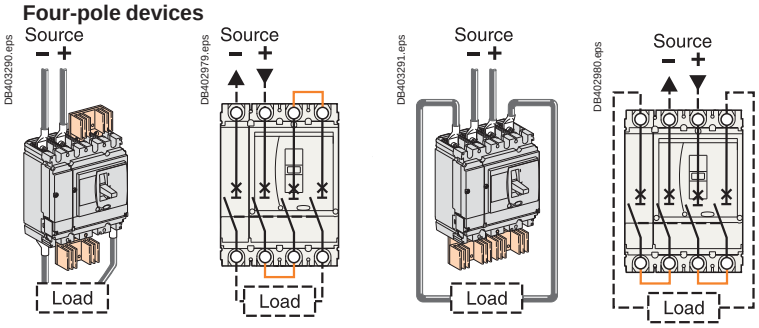
Two-pole devices



Three-pole devices

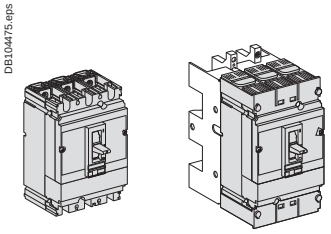


Four-pole devices

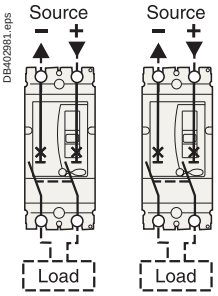


Great flexibility for connections

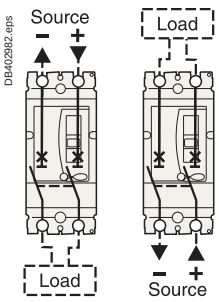
- All connections are possible for the fixed and withdrawable versions.
- Indifferent connection of polarities, from left to right or right to left.
- Indifferent connection of upstream and downstream cables to top or bottom terminals.
- Series connection of poles is possible by upstream/downstream connections. Creation of the connections is the responsibility of the panel builder or the installer.



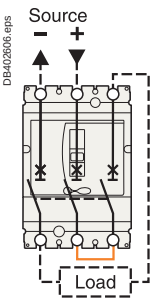
All connections are possible for the fixed and withdrawable versions.



Indifferent connection of polarities.



Upstream/downstream connections to top or bottom connectors.



Series connection of poles is possible by upstream/downstream connections (user made).

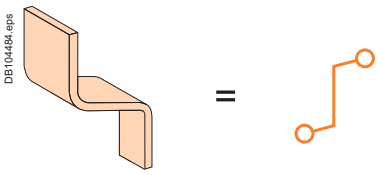
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Great flexibility in adapting to DC applications

Overview of series connection of poles for Masterpact NW DC

Masterpact NW DC circuit breakers, with high ratings and installed as incoming devices, offer three coupling versions C, D and E ready for connection.
The polarities “Line -”, “Line +” indicated on the rear connections of the Masterpact NW DC circuit breakers have to be respected in order to ensure the magnetic threshold tolerances.

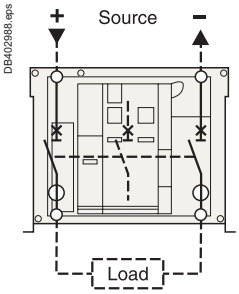
The safe prefabricated series connections are factory made due to the power ratings. They also dissipate heat.



Masterpact NW DC

Three versions supplied ready for connection

Version C

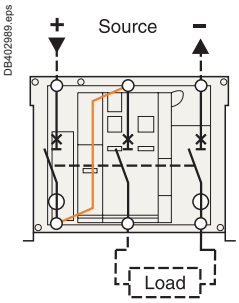


Front view: three-pole case - two poles in series.



Rear view.

Version D

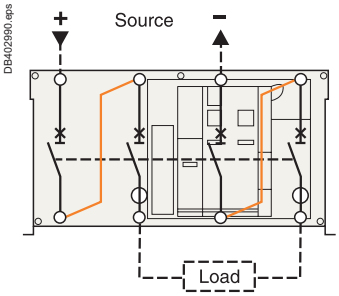


Front view: three-pole case - three poles in series.



Rear view with connections.

Version E



Front view: four-pole case - four poles in series.



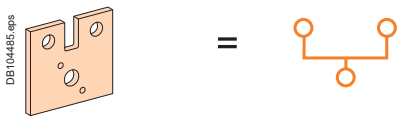
Rear view with connections.

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Great flexibility in adapting to DC applications

Parallel connection of poles

The exceptional performance levels of Compact NSX DC circuit breakers mean the poles can be parallel connected. This technique virtually doubles, triples or quadruples the current rating depending on the type of circuit breaker and thus reduces the cost of solutions.



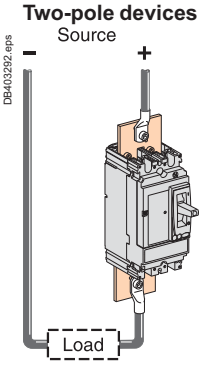
Parallel pole connection accessories are identical to those for series connections. The are equipped with heat sinks.
Customer connections are made directly to the connection plates after removing the heat sinks.

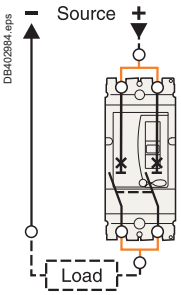


Specific connections are required for parallel connection of three poles.

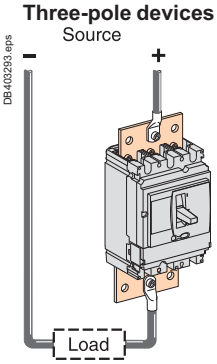
Examples of parallel connection

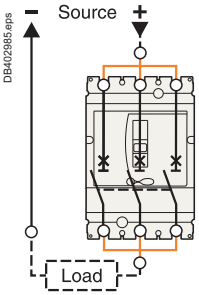
Two-pole devices



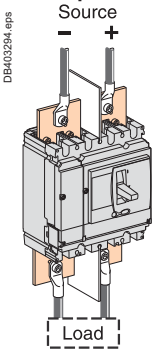


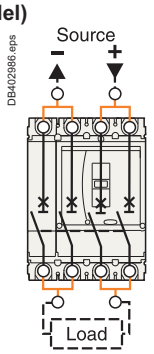
Three-pole devices



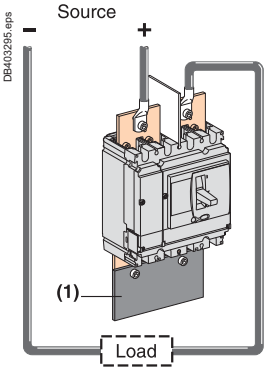


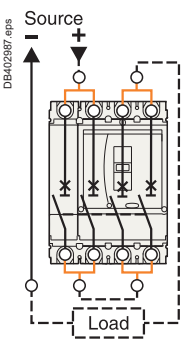
Four-pole devices (2 x 2 poles in parallel)





It is possible to mix series and parallel connections





Note: *creation of the additional connection* (1) *is the responsibility of the panel builder or the installer.*

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Functions and characteristics

Presentation 2

General characteristics of Compact NSX DC
Operating condition A-2
Compact NSX100 DC to NSX630 DC A-3

Trip-unit characteristics
Types of trip units - Trip units for Compact NSX DC A-6

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Masterpact NW10 to NW40 DC A-45

Connection
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Electrical and mechanical accessories
Masterpact NW10 to NW40 DC A-49

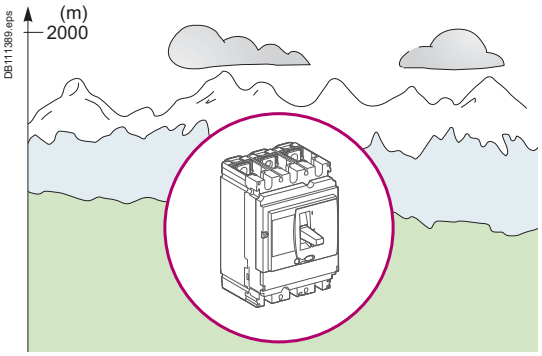
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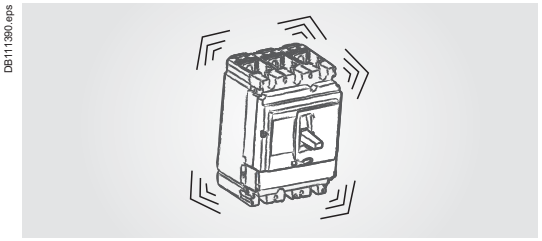
General characteristics of Compact NSX DC
Operating condition



Altitude

Compact NSX DC circuit breakers are designed to operate at their rated values at altitudes under 2000 metres.
Above 2000 metres, the changes in the characteristics of the ambient air (electrical resistance, cooling capacity) result in a reduction of the characteristics below.

Altitude (m)	2000	3000	4000	5000
Dielectric resistance voltage (V)	3500	3150	2500	2100
Compact NSX DC				
Rated insulation voltage (V)	750	700	600	500
Maximum utilisation voltage (V)	690	550	480	420
Rated current (A) at 40 °C	1 x In	0.96 In	0.93 In	0.9 In



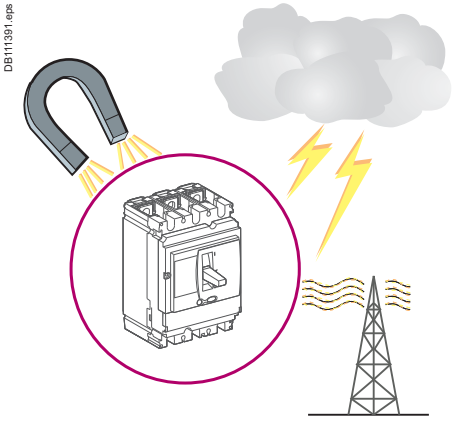
Vibrations

Compact NSX DC circuit breakers are guaranteed against electromagnetic or mechanical vibrations.
Tests are carried out in compliance with standard IEC 68-2-6 for the levels required by merchant-marine inspection organisations (Veritas, Lloyd's, etc.):
- 2 to 13.2 Hz: amplitude ±1 mm
- 13.2 to 100 Hz: constant acceleration 0.7 g.

Excessive vibration may cause tripping, breaks in connections or damage to mechanical parts.

Installation in class II switchboards

All Compact NSX DC circuit breakers are class II front-face devices. They may be installed through the door of class II switchboards (as per standard IEC 60664) without downgrading switchboard insulation. Installation requires no special operations even when the circuit breaker is equipped with a rotary handle or a motor mechanism.



Electromagnetic compatibility

Compact NSX DC ircuit breakers are protected against:
- overvoltages caused by devices that generate electromagnetic disturbances
- overvoltages caused by atmospheric disturbances or by a distribution-system outage (e.g. failure of a lighting system) and devices emitting radio waves (radios, walkie-talkies, radar, etc.)
- electrostatic discharges produced by users. The circuit breakers have successfully passed the electromagnetic-compatibility tests (EMC) defined by international standard IEC 60947-2, appendix F.

The above tests guarantee that:
- ◻ no nuisance tripping occurs
- ◻ tripping times are respected.

Compact NSX DC circuit breakers comply with the following electromagnetic-compatibility standards:
- IEC/EN 61000-4-2 - electrostatic immunity discharge test, part 2 (circuit breakers)
- IEC/EN 61000-4-3 - electromagnetic-field immunity test
- IEC/EN 61000-4-4 - electrical fast transient/burst immunity test
- IEC/EN 61000-4-5 - surge immunity test
- IEC/EN 61000-4-6 - immunity to conducted disturbances, induced by radiofrequency fields
- CISPR 11 - radio-frequency conducted and radiated emission tests required for CE marking
- ◻ EN 61000-6-2 - immunity standard for industrial environments
- ◻ EN 50081-1-2 - emissions in commercial and industrial environments.

Ambient temperature

Operating-temperature range

- Compact NSX DC circuit breakers may be used between -25 °C and +70 °C
- Circuit breakers should be put into service under the normal, ambient operating temperatures indicated above. Exceptionally, they may be put into service when the ambient temperature is between -35 °C and -25 °C.

Derating

Above 40 °C, it is necessary to take into account the derating values (Compact NSX DC).

Storage-temperature range

- Compact NSX DC circuit breakers may be stored in their original packing between -50 °C and +85 °C.

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Degree of protection

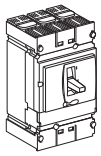
Compact NSX DC circuit breakers offer the following protection characteristics depending on the installation conditions:

- IP: degree of protection (standard IEC 60529)
- IK: protection against external mechanical impacts (standard EN 50102).

Compact NSX DC

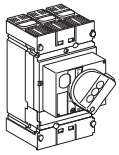
Bare circuit breaker with terminal shields

DB402607.eps



With toggle	IP40	IK07

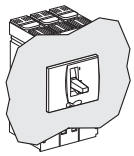
DB402608.eps



With direct rotary handle, standard or VDE	IP40	IK07

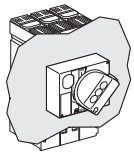
Circuit breaker installed in a switchboard

DB402609.eps



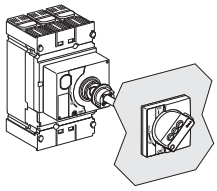
With toggle	IP40	IK07

DB402610.eps



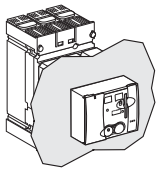
With direct rotary handle, standard or VDE	IP40	IK07
CCM	IP43	IK07
CNOMO	IP54	IK07

DB402611.eps



With extended rotary handle	IP55	IK08

DB402612.eps



With motor mechanism	IP40	IK07

Positive contact indication

DB403582.eps



Compact NSX DC circuit breakers are suitable for isolation as defined by IEC 60947-1 and 60947-2:

- the isolation position corresponds to the O (OFF) position
- the operating handle and the indicators cannot indicate the OFF position unless the contacts are effectively open
- padlocks may not be installed unless the contacts are open.

The isolation function is certified by tests guaranteeing:

- the mechanical reliability of the position-indication system
- the absence of leakage currents
- overvoltage withstand capacity between upstream and downstream connections.

For Compact NSX DC, installation of a rotary handle or a motor mechanism does not alter the reliability of the position-indication system.

DB116888.eps



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Circuit breaker characteristics
Compact NSX100 DC to NSX630 DC

pb107518_13_r.eps



pb107524-19_r.eps



PB107547_32.eps



PB105035_31r.eps



Compact circuit breaker				
Number of poles				
Electrical characteristics as per IEC 60947-1/ 60947-2 and EN 60947-1 / 60947-2				
Rated current at 40 °C	**In**	(A)		
Rated insulation voltage	**Ui**	(V)		
Rated impulse withstand voltage	**Uimp**	(kV peak)		
Rated operational voltage	**Ue**	(V DC)		
Type of circuit breaker				
Ultimate breaking capacity (L/R = 5 ms and L/R = 15 ms)	**Icu**	(kA rms)	V DC	48-125 V (1P) (1)
				250 V (1P) (1)
				500 V (2P) (1)
				750 V (3P) (1)
Service breaking capacity	**Ics**	% Icu		
Rated making capacity	**Icm**	% Icu		
Utilisation category				
Breaking time		(ms)		
Suitability for isolation				
Pollution degree (as per IEC 60664-1)				
Protection against overcurrents (see trip-unit table page A-7)				
Trip units				Built-in
				Interchangeable
Protection				Overloads
				Short-circuits
Durability				
(O/C cycles)	Mechanical			
	Electrical			250 V In
				250 V In/2
				500 V In
				500 V In/2
				750 V In
				750 V In/2
Indication and control auxiliaries				
Auxiliary contacts				
Voltage release	MX shunt release			
	MN undervoltage release			
Installation and connections				
Fixed				Front connection
				Rear connection
Plug-in (base)				Front connection
				Rear connection
Withdrawable (chassis)				Front connection
				Rear connection
Control	Manual	with toggle		
		with direct or extended rotary handle		
	Electrical	with remote control		
Dimensions and weight				
Dimensions H x W x D (mm) connected in series	Fixed			1P
				2P
				3P
				4P
Weight (kg) connected in series	Fixed			1P
				2P
				3P
				4P

(1) Number of poles taking part in current interruption.
Example. The NSX100N DC circuit breaker exists in the following versions:
- 1 pole with an Icu of 50 kA, for systems ≤ 250 V
- 2 poles with an Icu of 85 kA, for systems ≤ 500 V; 1 pole can be used in a 250 V system.

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	NSX100 DC								NSX160 DC								NSX250 DC		NSX400 DC		NSX630 DC	
	1			2			3/4		1			2			3/4		3/4		3/4		3/4	
	100								160								250		400		550	
	750								750								750		750		750	
	8								8								8		8		8	
	250			500			750		250			500			750		750		750		750	
	F	N	M	F	M	S	F	S	F	N	M	F	M	S	F	S	F	S	F	S	F	S
	36	50	85	36	85	100	36	100	36	50	85	36	85	100	36	100	36	100	36	100	36	100
	36	50	85	36	85	100	36	100	36	50	85	36	85	100	36	100	36	100	36	100	36	100
	-	-	-	36	85	100	36	100	-	-	-	-	85	100	36	100	36	100	36	100	36	100
	-	-	-	-	-	-	36	100	-	-	-	-	-	-	36	100	36	100	36	100	36	100
	100 %																					
	100 %																					
	A																					
	< 10 ms																					
	■																					
	3																					
	■	■	■	■	■	■	-		■	■	■	■	■	■	-		-		■		■	
	-	-	-	-	-	-	■		-	-	-	-	-	-	■		■		-		-	
	■	■	■	■	■	■	■		■	■	■	■	■	■	■		-		-		-	
	■	■	■	■	■	■	■		■	■	■	■	■	■	■		■		■		■	
	10000																		5000			
	5000																		1000			
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	-	-	-	-	-	-	■		-	-	-	-	-	-	■		■		■		■	
	-	-	-	-	-	-	■		-	-	-	-	-	-	■		■		■		■	
	■																					
	■																					
	■																					
	161 x 35 x 86			-			-		161 x 35 x 86			-			-				-			
	-			161 x 70 x 86			-		-			161 x 70 x 86			-				-			
	-			-			161 x 105 x 86		-			-			161 x 105 x 86				255 x 140 x 110			
	-			-			161 x 140 x 86		-			-			161 x 140 x 86				225 x 185 x 110			
	0.7			-			-		0.7			-			-				-			
	-			1.2			-		-			1.2			-				-			
	-			-			1.6 to 1.9		-			-			1.6 to 1.9				6.0			
	-			-			2.1 to 2.3		-			-			2.1 to 2.3				7.8			

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Trip-unit characteristics
Types of trip units
Trip units for Compact NSX DC


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Depending on the version, Compact NSX DC circuit breakers are equipped with:
■ 1P/2P: TM-D built-in thermal-magnetic trip units.

Trip units for Compact NSX100 DC - NSX160 DC - NSX250 DC
Single-pole and two-pole (built-in trip units)

Type of trip unit			TM-D										
Rating		In (A) at 40 °C	16	20	25	32	40	50	63	80	100	125	160
Compact circuit breaker	NSX100N/H DC		■	■	■	■	■	■	■	■	■	-	-
	NSX160N/H DC		-	-	-	-	-	-	-	-	-	■	■
Overload protection (thermal)													
Tripping threshold		Ir (A) at 40 °C	Fixed										
			16	20	25	32	40	50	63	80	100	125	160
Protection against short-circuits (magnetic)													
Pick-up		Im (A)	Fixed										
Compact circuit breaker	NSX100/ 160N/H DC	Marked AC value (1)	190	190	300	300	500	500	500	640	800	1000	1250
		True DC value	260	260	400	400	700	700	700	800	1000	1200	1250


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Depending on the version, Compact NSX DC circuit breakers are equipped with:
■ 3P/4P:
□ up to 250 A, TM-D, TM-DC or TM-G interchangeable thermal-magnetic trip units
□ for 400 and 630 A, MP1, MP2, MP3 built-in magnetic trip units.

Trip units for Compact NSX100 DC - NSX160 DC - NSX250 DC
Three-pole 3P-3d and four-pole 4P-4d (interchangeable trip units)

Type of trip unit			TM-D						TM-DC						TM-G			
Rating (A)		In (A) at 40 °C	16	25	32	40	50	63	80	100	125	160	200	250	16	25	40	63
Compact circuit breaker	NSX100 DC		■	■	■	■	■	■	■	■	-	-	-	-	■	■	■	■
	NSX160 DC		■	■	■	■	■	■	■	■	■	■	-	-	■	■	■	■
	NSX250 DC		-	-	-	-	-	-	■	■	■	■	■	■	-	-	-	-
Overload protection (thermal)																		
Tripping threshold (A)		Ir (at 40 °C)	Adjustable															
			0.7 to 1 x In															
Protection against short-circuits (magnetic)																		
Pick-up (A)		Im	Fixed										Adjustable		Fixed			
Compact circuit breaker	NSX100/160/ NSX250 DC	Marked AC value (1)	190	300	400	500	500	500	-	-	-	-	-	-	63	80	80	125
		True DC value	260	400	550	700	700	700	800	800	1250	1250	5 to 10 x In		80	100	100	150


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(1) The pick-up values for single-pole and two-pole, TMD and TMG magnetic trip units up to 63 A are marked with AC values. A correction coefficient is required to obtain the DC pick-up values indicated on the next line.
The magnetic-protection pick-up values for TM-DC trip units are indicated directly in DC values.


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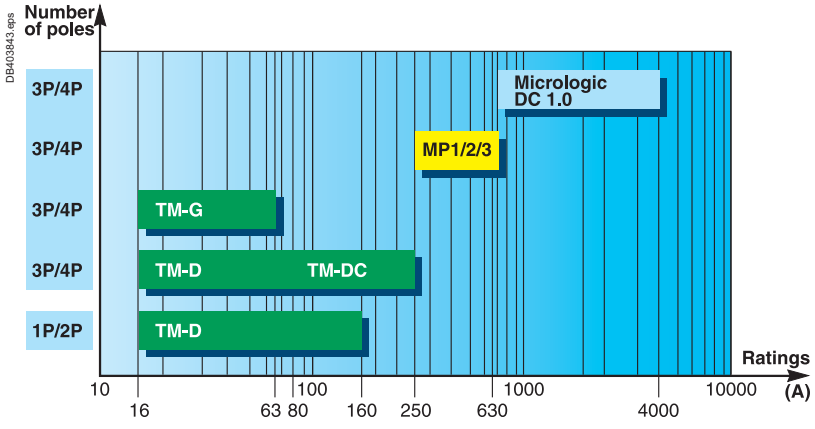
Compact NSX400 DC - NSX630 DC trip units
Three-pole 3P-3d and four-pole 4P-3d (built-in trip units)

Type of trip unit		MP1	MP2	MP3
Circuit breaker	Compact NSX400 DC	■	■	-
	Compact NSX630 DC	■	■	■
Protection against short-circuits (magnetic)				
Pick-up (A)	Im	Adjustable	-	-
		800…1600	1250…2500	2000…4000

Above 250 A, the protection of Compact NSX400 DC and 630 DC circuit breakers is ensured by built-in magnetic trip units supplied mounted on the circuit breaker and offering one of three protection levels MP1, MP2 and MP3.

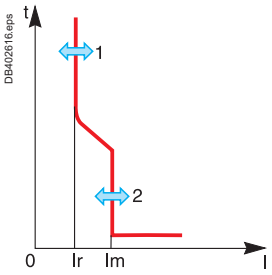
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Types of trip units



see page A-7
see page B-7
(parallel connection of poles)

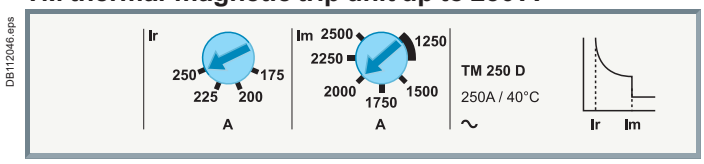
see page A-38



1 *overload protection threshold.*
2 *short-circuit protection pick-up.*

Trip units for Compact NSX DC

TM thermal-magnetic trip unit up to 250 A

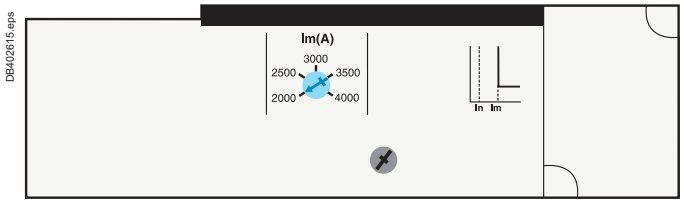


Up to 250 A for Compact NSX DC, protection is provided by thermal-magnetic trip units.

For 1 or 2 poles, trip units are built in
- TM-D up to 160 A: fixed thermal threshold and magnetic pick-up

For 3 or 4 poles, trip units are interchangeable
- TM-D up to 63 A: adjustable thermal threshold and fixed magnetic pick-up
- TM-DC from 80 to 250 A: fixed or adjustable (for 200 and 250 A) magnetic pick-up and adjustable thermal threshold
- TM-G, up to 63 A: adjustable thermal threshold and fixed low magnetic pick-up to protect long cables.

MP magnetic trip unit for 400 and 630 A



Above 250 A, the protection of Compact NSX400 DC and 630 DC circuit breaker is ensured by built-in magnetic trip unit, offering one of three protection levels MP1, MP2 or MP3.

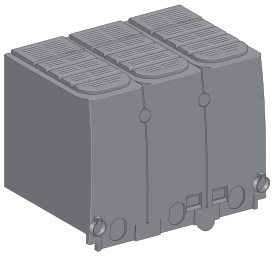
For reference only. www.fengshengelectric.com.sg

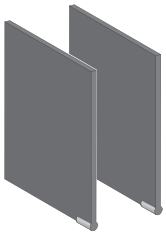
Accessories and auxiliaries

Overview of Compact NSX100 to 630 DC fixed version

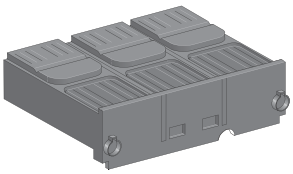
Insulation accessories

DB403587.eps





Interphase barriers



Sealable terminal shields

Electrical auxiliaries ▶ A-21

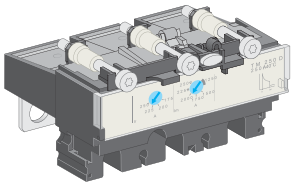


Indication contact



Voltage release

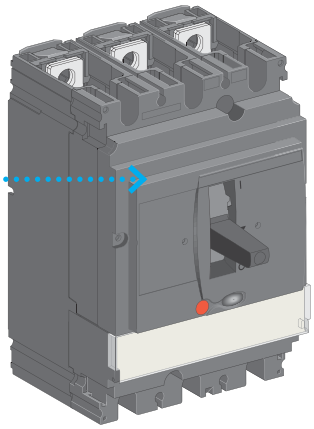
Protection and measurements

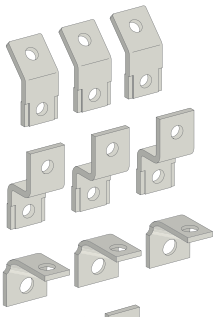


TM-D, TM-G trip unit

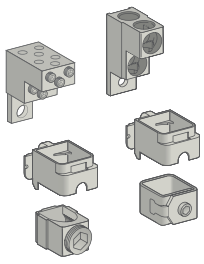
For reference only. www.fengshengelectric.com.sg

Connection ▶ A-14

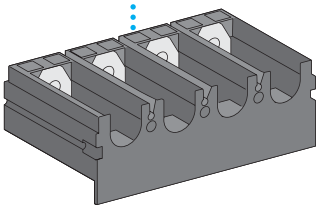




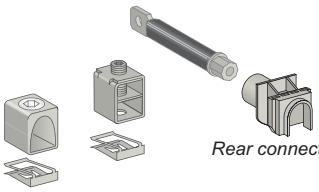
Terminal extensions



Cable connectors



One-piece spreader



Cable connectors

Rear connectors

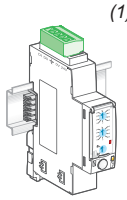
Communication



(1) NSX cord

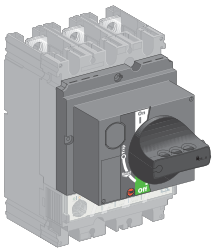


(1) BSCM module

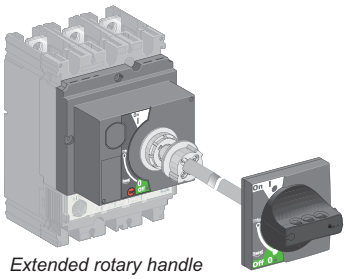


(1) o bus interface

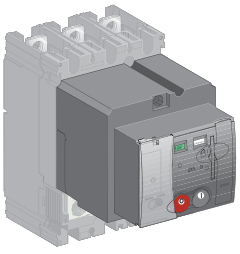
Control accessories ▶ A-24



Direct rotary handle



Extended rotary handle



Motor mechanism

(1) Compact NSX100-250 only.

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Accessories and auxiliaries

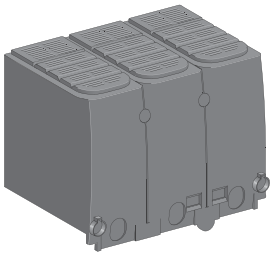
Overview of Compact NSX100 to 630 DC plug-in and withdrawable versions

Insulation accessories

DB403588.eps

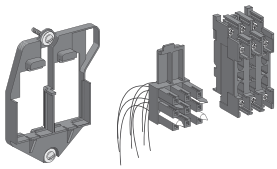


Interphase barriers

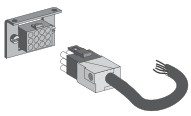


Sealable long terminal shields for plug-in base

Electrical accessories ▶ A-16

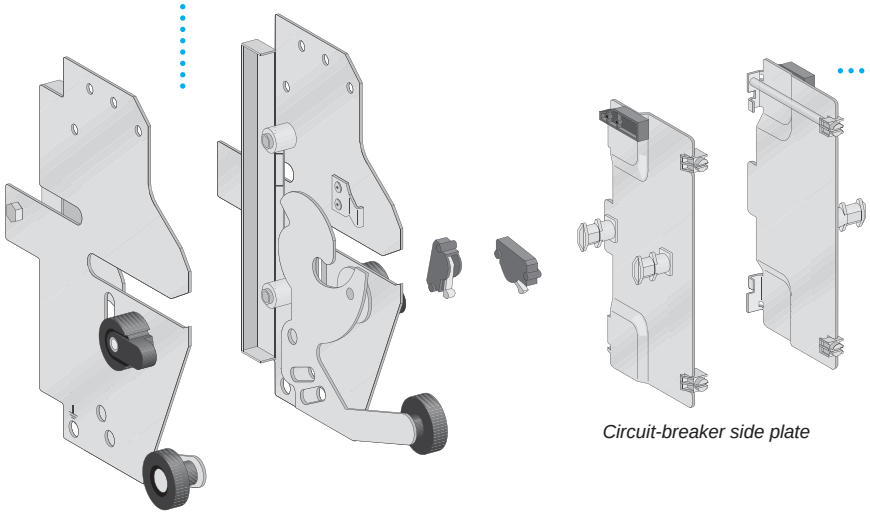


Automatic withdrawable auxiliary connector



Manual auxiliary connector

Mechanical accessories ▶ A-13

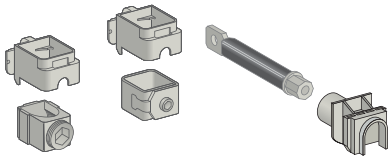


Chassis side plate

Circuit-breaker side plate

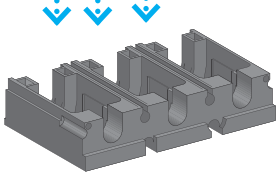
For reference only. www.fengshengelectric.com.sg

Connection ▶ A-14 and A-16

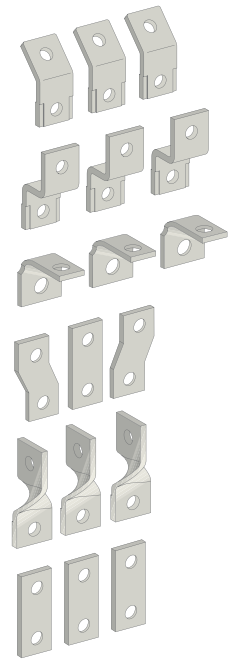


Cable connectors

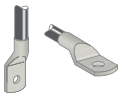
Rear connectors



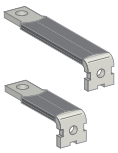
Adapter



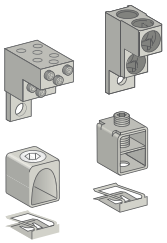
Terminal extensions



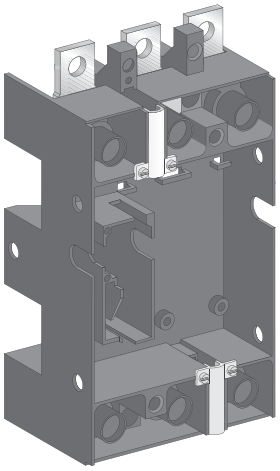
Lugs



Rear connectors

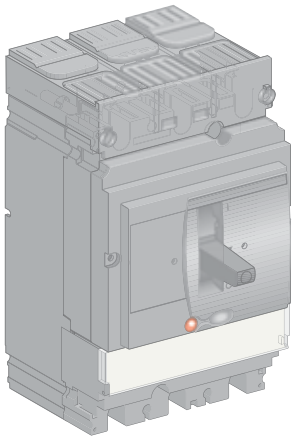


Cable connectors

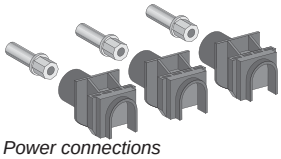


Plug-in base

Circuit breaker



Power connection accessories



Power connections

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Electrical and mechanical accessories
Compact NSX100 to 630 DC

Compact NSX DC circuit breakers may be installed horizontally, vertically or flat on their back, without derating performance levels.
There are three installation versions:
- fixed
- plug-in (on a base)
- withdrawable (on a chassis).

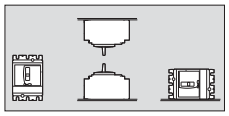
For the last two, components must be added (base, chassis) to the fixed version.
Many connection components are shared by the three versions.

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Fixed Compact NSX250 DC.

DB112208.eps



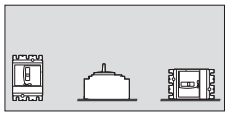
Installation positions.

PB104934.eps



Plug-in
Compact NSX250 DC.

DB112209.eps

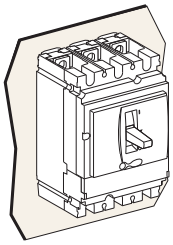


Installation positions.

Fixed circuit breakers

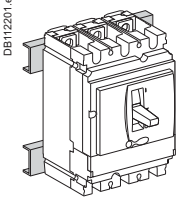
Fixed circuit breakers are designed for standard connection using bars or cables with lugs. Bare-cable connectors are available for connection to bare copper or aluminium cables.
For connection of large cables, a number of solutions with spreaders may be used for both cables with lugs or bare cables.

DB112200.eps



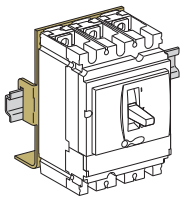
Mounting on a backplate.

DB112201.eps



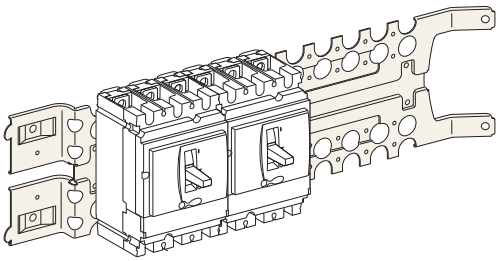
Mounting on rails.

DB112202.eps



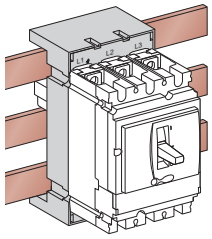
Mounting on DIN rail (with adapter).

DB112203.eps



Mounting on a Prisma mounting plate.

DB112204.eps



Mounting on busbars with an adapter.

Plug-in base circuit breakers

The plug-in version makes it possible to:
- extract and/or rapidly replace the circuit breaker without having to touch the connections on the base
- allow for the addition of future circuits by installing bases that will be equipped with a circuit breaker at a later date
- isolate the power circuits when the device is mounted on or through a panel. It acts as a barrier for the connections of the plug-in base. Insulation is made complete by the mandatory short terminal shields on the device. The degrees of protection are:
  - circuit breaker plugged in = IP4
  - circuit breaker removed = IP2
  - circuit breaker removed, base equipped with shutters = IP4.

Parts of a plug-in configuration

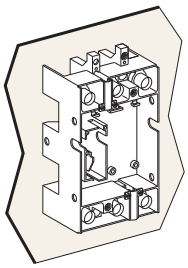
A plug-in configuration is made by adding a "plug-in kit" to a fixed device.
To avoid connecting or disconnecting the power circuits under load conditions, a safety trip causes automatic tripping if the device is ON, before engaging or withdrawing it. The safety trip, supplied with the kit, must be installed on the device. If the device is disconnected, the safety trip does not operate. The device can be operated outside the switchboard.

Accessories

Optional insulation accessories are available.
- Terminal shields to protect against direct contact.
- Interphase barriers to reinforce insulation between phases and protect against direct contact.

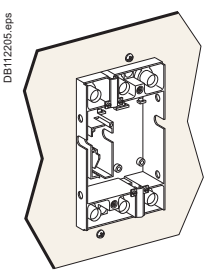
Mounting

DB112206.eps



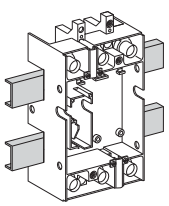
Mounting on a backplate.

DB112205.eps



Mounting through a front panel.

DB112207.eps



Mounting on rails.

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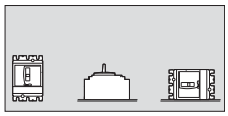
■ disconnected position - the power circuits are disconnected, but the circuit breaker is still on the chassis and may still be operated (ON, OFF, push-to-trip)
■ the circuit breaker may be locked using 1 to 3 padlocks (shackle diameter 5 to 8 mm), to prevent connection
■ the auxiliaries can be tested (with manual auxiliary connector).

PB104935.eps



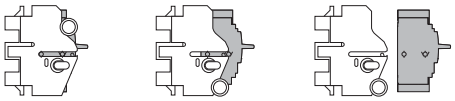
Withdrawable Compact NSX250 DC.

DB112209.eps



Installation positions.

DB112210.eps



Connected. *Disconnected.* *Removed.*

Withdrawable circuit breakers

In addition to the advantages provided by the base, installation on a chassis facilitates handling. It offers three positions, with transfer from one to the other after mechanical unlocking:
■ connected: the power circuits are connected
■ disconnected: the power circuits are disconnected, the device can be operated to check auxiliary operation
■ removed: the device is free and can be removed from the chassis.

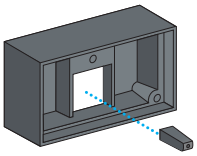
Parts of a withdrawable configuration

A withdrawable configuration requires two side plates installed on the base and two sides plates mounted on the circuit breaker. Similar to the plug-in version, a safety trip causes automatic tripping if the device is ON, before engaging or withdrawing it, and enables device operation in the disconnected position.

Accessories

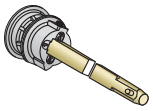
Accessories are the same as for the base, with in addition:
■ auxiliary contacts for installation on the fixed part, indicating the “connected” and “disconnected” positions
■ locking by 1 to 3 padlocks (shackle diameter 5 to 8 mm), to:
□ prevent insertion for connection
□ lock the circuit breaker in connected or disconnected position
■ toggle collar for circuit breakers with a toggle mounted through a front panel, intended to maintain the degree of protection whatever the position of the circuit breaker (supplied with a toggle extension)
■ telescopic shaft for extended rotary handles. The door can then be closed with the device in the connected and disconnected positions.

DB111369.eps



Protection collar for toggle and toggle extension to provide IP4 in the connected and disconnected positions.

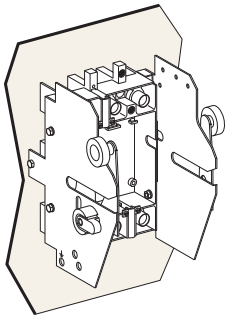
DB112219.eps



Telescopic shaft.

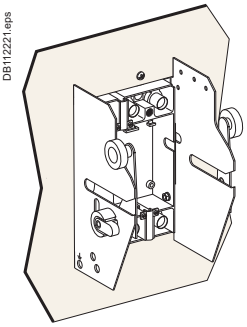
Mounting

DB112220.eps



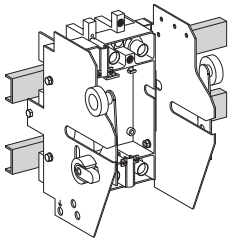
Mounting on a backplate.

DB112221.eps



Mounting through a front panel.

DB112312.eps



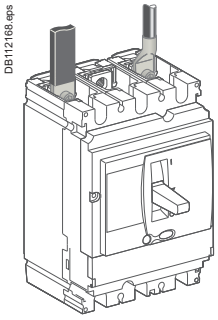
Mounting on rails.

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Electrical and mechanical accessories

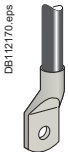
Connection of fixed devices

Fixed circuit breakers are designed for standard front connection using bars or cables with lugs.
Cable connectors are available for bare cables. Rear connection is also possible.

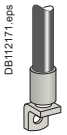




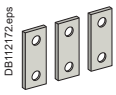
Insulated bar.



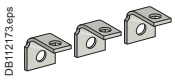
Small lug for copper cables.



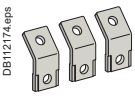
Small lug for Al cables.



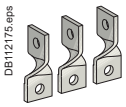
Straight terminal extensions.



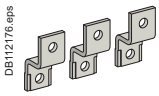
Right-angle terminal extensions.



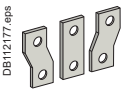
45° terminal extensions.



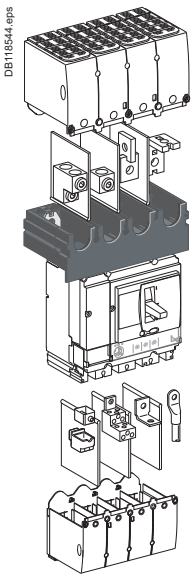
Edgewise terminal extensions.

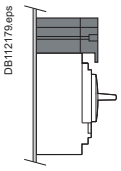


Double-L terminal extensions.

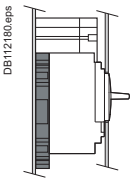


Spreaders.





Mounting at the back of a switchboard.



Mounting behind the front panel with a raiser.

Front connection

Bars or cables with lugs

Standard terminals

Compact NSX100 to 630 DC come with terminals comprising snap-in nuts with screws:

- Compact NSX100 DC: M6 nuts and screws. Compact NSX160/250 DC: M8 nuts and screws
- Compact NSX400/630 DC: M10 nuts and screws.

These terminals may be used for:

- direct connection of insulated bars or cables with lugs
- terminal extensions offering a wide range of connection possibilities.

Interphase barriers or terminal shields are recommended. They are mandatory for certain connection accessories (in which case the interphase barriers are provided).

Bars

When the switchboard configuration has not been tested, insulated bars are mandatory.

Maximum size of bars

Compact NSX DC circuit breaker		100/160/250 DC	400/630 DC
Without spreaders	pitch (mm)	35	45
	maximum bar size (mm)	20 x 2	32 x 6
With spreaders	pitch (mm)	45	52.5
	maximum bar size (mm)	32 x 2	40 x 6

Crimp lugs

There are two models, for aluminium and copper cables.
It is necessary to use narrow lugs, compatible with device connections. They must be used with interphase barriers or long terminal shields. The lugs are supplied with interphase barriers and may be used for the types of cables listed below.

Cable sizes for connection using lugs

Compact NSX DC circuit breaker		100/160/250 DC	400/630 DC
Copper cables	size (mm²)	120, 150, 185	240, 300
	crimping	hexagonal barrels or punching	
Aluminium cables	size (mm²)	120, 150, 185	240, 300
	crimping	hexagonal barrels	

Terminal extensions

Extensions with anti-rotation ribs can be attached to the standard terminals to provide numerous connection possibilities in little space:

- straight terminal extensions
- right-angle terminal extensions
- edgewise terminal extensions
- double-L extensions
- 45° extensions.

Spreaders

Spreaders may be used to increase the pitch:

- NSX100 to 250 DC: the 35 mm pitch can be increased to 45 mm
- NSX400/630 DC: the 45 mm pitch can be increased to 52 or 70 mm.

Bars, cable lugs or cable connectors can be attached to the ends.

One-piece spreader for NSX100 to 250 DC

Connection of large cables may require an increase in the distance between the device terminals.
The one-piece spreader is the means to:

- increase the 35 mm pitch of the NSX100 to 250 DC circuit-breaker terminals to the 45 mm pitch of a NSX400/630 DC device
- use all the connection and insulation accessories available for the next largest frame size (lugs, connectors, spreaders, right-angle and edgewise terminal extensions, terminal shields and interphase barriers).

It may also be used for Interpact INS switch-disconnectors.
Equipped with a single-piece spreader, Compact NSX DC devices can be mounted:

- at the back of a switchboard
- behind the front panel with a raiser.

The one-piece spreader is also the means to:

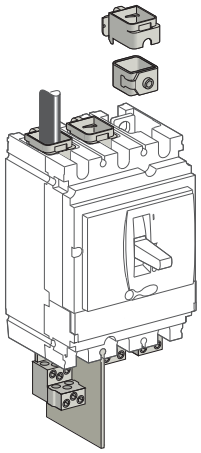
- align devices with different frame sizes in the switchboard
- use the same mounting plate, whatever the device.

Pitch (mm) depending on the type of spreader

Compact NSX DC circuit breaker	NSX100 to 250 DC	NSX100 to 630 DC
Without spreaders	35	45
With spreaders	45	52.5 or 70
With one-piece spreader	45	-

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DB112314.eps



Bare cable.

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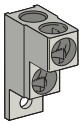
1-cable connector for NSX100 to 250 DC.

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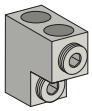
NSX400/ 630 DC.

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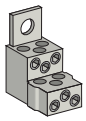
2-cable connector for NSX100 to 250 DC.

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NSX400/ 630 DC.

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Distribution connector for NSX100 to 250 DC.

Bare cables

For bare cables (without lugs), the prefabricated bare-cable connectors may be used for both copper and aluminium cables.

Cable connectors for Compact NSX100 to 250 DC
The connectors snap directly on to the device terminals or are secured by clips to right-angle and straight terminal extensions as well as spreaders.

Cable connectors for Compact NSX400 to 630 DC
The connectors are screwed directly to the device terminals.

Cable connectors for Compact NSX100 to 250 and 400/630 DC
The connectors are screwed to device terminals or right-angle terminal extensions.

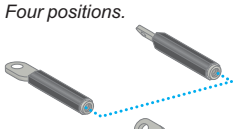
Distribution connectors for Compact NSX100 to 250 DC
These connectors are screwed directly to device terminals. Interphase barriers are supplied with distribution connectors, but may be replaced by long terminal shields. Each connector can receive six cables with cross-sectional areas ranging from 1.5 to 35 mm² each.

Maximum size of cables depending on the type of connector

Compact NSX DC circuit breaker		100/160 DC	250 DC	400 DC	630 DC
Steel connectors	1.5 to 95 mm²	■			
Aluminium connectors	25 to 95 mm²	■	■		
	120 to 185 mm²	■	■		
	2 cables 50 to 120 mm²	■	■		
	2 cables 35 to 240 mm²			■	■
	35 to 300 mm²			■	■
Distribution connectors	6 cables 35 mm²	■	■		

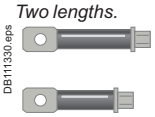
Four positions.

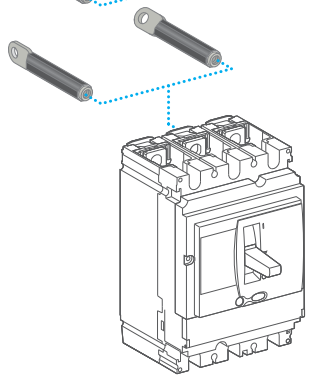
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Two lengths.

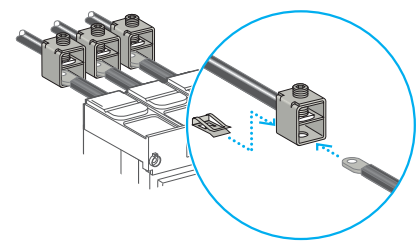
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Rear connection.

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Connection of bare cables to NSX100 to 250 DC.

Rear connection

Device mounting on a backplate with suitable holes enables rear connection.

Bars or cables with lugs

Rear connections for bars or cables with lugs are available in two lengths. Bars may be positioned flat, on edge or at 45° angles depending on how the rear connections are positioned.
The rear connections are simply fitted to the device connection terminals. All combinations of rear connection lengths and positions are possible on a given device.

Bare cables

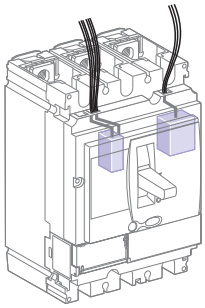
For the connection of bare cables, the 1-cable connectors for Compact NSX100 to 250 DC may be secured to the rear connections using clips.

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Electrical and mechanical accessories

Connection of electrical auxiliaries

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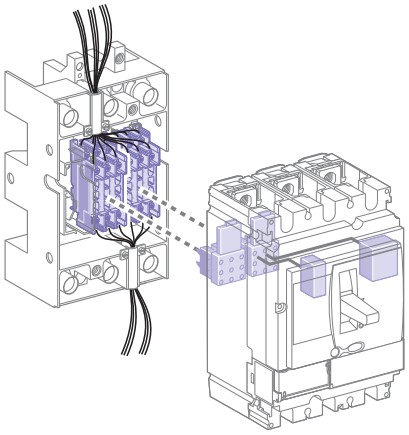


Fixed Compact NSX DC.

Fixed Compact NSX100-250 DC

Auxiliary circuits exit the device through a knock-out in the front cover.

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Plug-in/withdrawable Compact NSX DC.

Withdrawable or plug-in Compact NSX DC

Automatic auxiliary connectors

Auxiliary circuits exit the circuit breaker via one to three automatic auxiliary connectors (nine wires each). These are made up of:

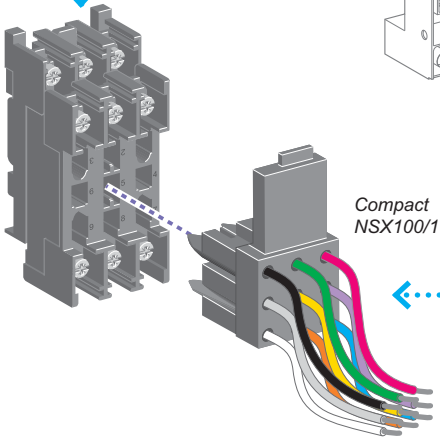
- a moving part, connected to the circuit breaker via a support (one support per circuit breaker)
- a fixed part, mounted on the plug-in base, equipped with connectors for bare cables up to 2.5 mm².

Micrologic trip unit options are also wired via the automatic auxiliary connectors.

Selection of automatic auxiliary connectors

Depending on the functions installed, one to three automatic auxiliary connectors are required.

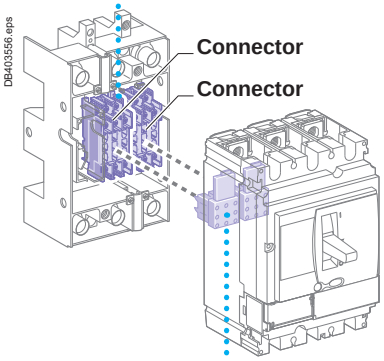
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Automatic auxiliary connector: Fixed part

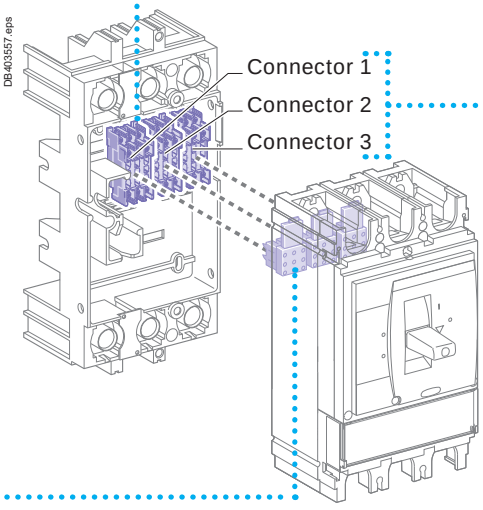
Moving part

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Compact NSX100/160/250 DC.

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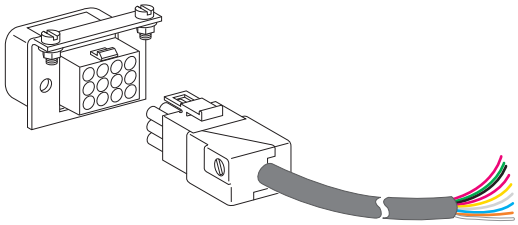
Compact NSX400/630 DC.

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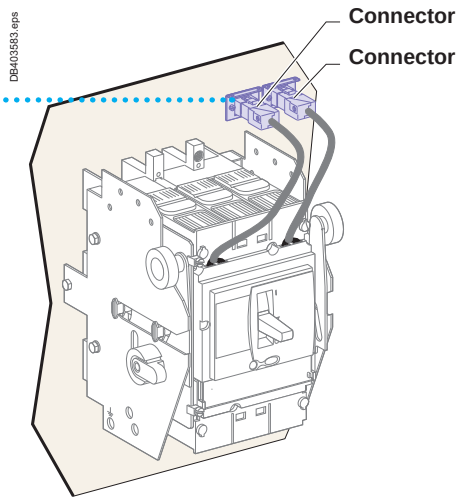
Withdrawable Compact NSX DC

Manual auxiliary connectors

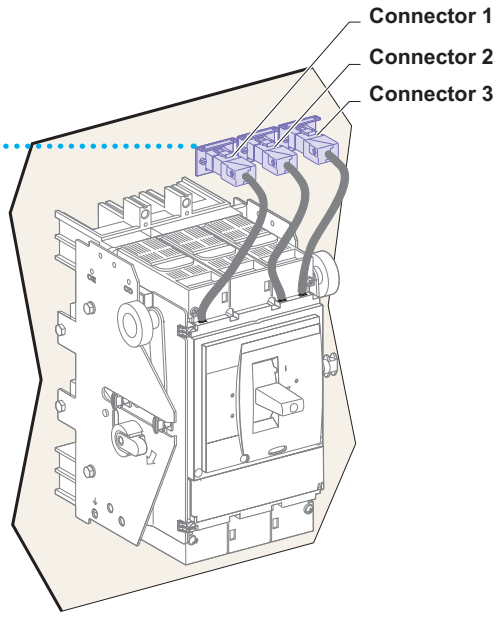
As an option to the automatic auxiliary connectors, withdrawable circuit breakers may be equipped with one to three plugs with nine wires each. In "disconnected" position, the auxiliaries remain connected.
They can then be tested by operating the device.



Nine-wire manual auxiliary connector.



Compact NSX100/160/250 DC.



Compact NSX400/630 DC.

Each auxiliary is equipped with a terminal block with numbered terminals for connection of wires up to:
- 1.5 mm² for auxiliary contacts and voltage releases
- 2.5 mm² for the motor-mechanism module.

Circuit breaker	Connector 1	Connector 2	Connector 3
	OF1 MN/ MX SD	OF2 SDE NSX cord MT 24 V DC	OF3
NSX100/160/250 DC	■	■	-
NSX400/630 DC	■	■	■

***MT**: motor mechanism.*

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Electrical and mechanical accessories

Selection of auxiliaries for Compact NSX100/160/250 DC

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Remote tripping

MX or MN voltage releases are used to trip the circuit breaker.

MN undervoltage release

This release trips the circuit breaker when the control voltage drops below a tripping threshold:

- tripping threshold between 0.35 and 0.7 times the rated voltage
- circuit breaker closing is possible if the voltage exceeds 0.85 times the rated voltage. For a lower value, circuit breaker closing cannot be guaranteed.

Circuit breaker tripping by an MN release meets the requirements of standard IEC 60947-2.

Time-delay unit for an MN release

Eliminates nuisance tripping due to transient voltage dips lasting 200 ms.
It is used in conjunction with:

- a 250 V DC MN release, control voltage 220/240 V AC
- a 48 V DC MN release, control voltage 48 V AC.

MX shunt release

Trips the circuit breaker when the control voltage rises above 0.7 x Un.
Control signals can be of the impulse type (≥ 20 ms) or maintained.

Operation

When the circuit breaker has been tripped by an MN or MX release, it must be reset locally.
MN or MX tripping takes priority over manual closing.
In the presence of a standing trip order, closing of the contacts, even temporary, is not possible.

Mechanical characteristics

- endurance is equal to 50 % of the mechanical endurance of the circuit breaker
- the releases clip in behind the front cover
- connection using wires up to 1.5 mm^2, to integrated terminal blocks.

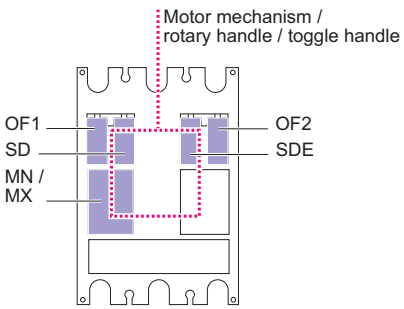
Electrical characteristics

- consumption:
  - pick-up (MX): < 30 VA
  - seal-in (MN and MNR): < 5 VA.
- response time: < 50 ms.

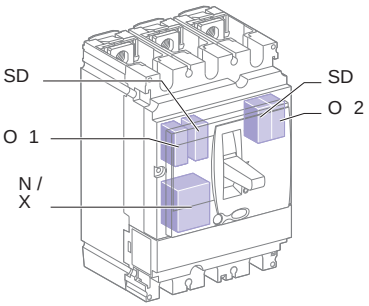
NA, TMD, TMG, MA

Standard

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DB403012.eps



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Communication

Communication requires specific auxiliaries (see page A-24).

Communication of status indications (1)

- 1 BSCM module.
- 1 NSX cord (internal terminal block) for both communication and 24 V DC supply to the BSCM.

Communication of status conditions is compatible with a toggle handle and a rotary handle.

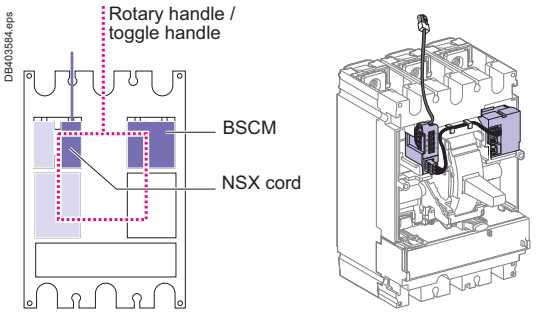
Communication of status indications and controls

This requires, in addition to the previous auxiliaries:

- 1 IFM connected to the BSCM.

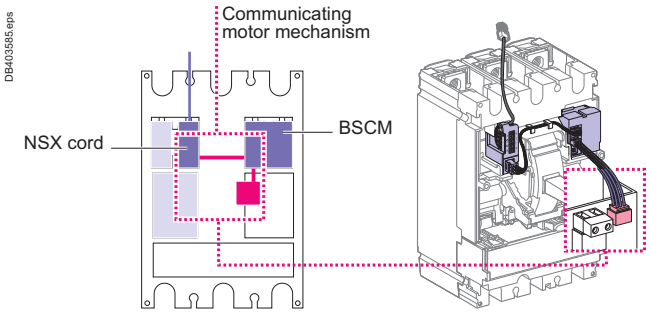
TMD, TMG

Communication of status indications (1)



or

Communication of status indications (1)



(1) Compact NSX100-250 DC only.

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Electrical and mechanical accessories

Selection of auxiliaries for Compact NSX400/630 DC

Standard

All Compact NSX400/630 DC circuit breakers and switch-disconnectors have slots for the electrical auxiliaries listed below.

5 indication contacts (see page A-21)
- 3 ON/OFF (OF1, OF2, OF3)
- 1 trip indication (SD)
- 1 fault-trip indication (SDE).

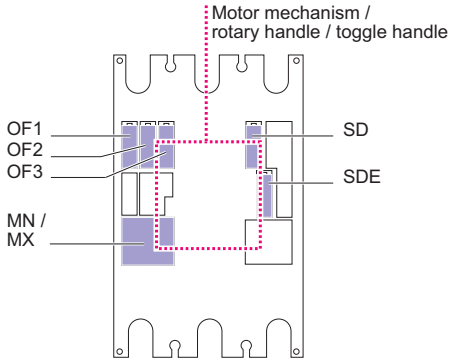
1 remote-tripping release (see page A-25)
- either 1 MN undervoltage release
- or 1 MX shunt release.

All these auxiliaries may be installed with a motor mechanism or a rotary handle or toggle handle.

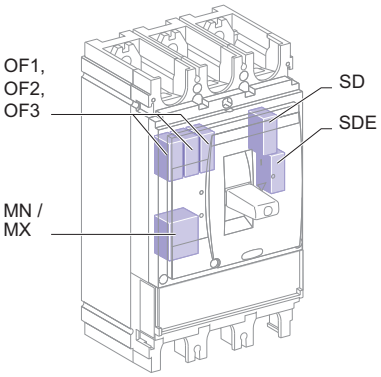
NA, MP1, MP2, MP3

Standard

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Indication contacts for Compact NSX DC

One contact model provides circuit-breaker status indications (OF - SD - SDE).
An early-make or early-break contact, in conjunction with a rotary handle, can be used to anticipate device opening or closing.
A CE / CD contact indicates that the chassis is connected / disconnected.

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Indication contacts.

PB103706-68.eps



CE/CD carriage switches.

These common-point changeover contacts provide remote circuit-breaker status information.
They can be used for indications, electrical locking, relaying, etc.
They comply with the IEC 60947-5 international recommendation.

Functions

Breaker-status indications, during normal operation or after a fault
A single type of contact provides all the different indication functions:
■ OF (ON/OFF) indicates the position of the circuit breaker contacts
■ SD (trip indication) indicates that the circuit breaker has tripped due to:
□ an overload
□ a short-circuit
□ operation of a voltage release
□ operation of the "push to trip" button
□ disconnection when the device is ON.
The SD contact returns to de-energised state when the circuit breaker is reset.
■ SDE (fault-trip indication) indicates that the circuit breaker has tripped due to:
□ an overload
□ a short-circuit.
The SD contact returns to de-energised state when the circuit breaker is reset.

Rotary-handle position contact for early-make or early-break functions
■ CAM (early-make or early-break function) contacts indicate the position of the rotary handle.
They are used in particular for advanced opening of safety trip devices (early break) or to energise a control device prior to circuit-breaker closing (early make).

Chassis-position contacts
■ CE/CD (connected/disconnected) contacts are microswitch-type carriage switches for withdrawable circuit breakers.

Installation

■ OF, SD, SDE functions: a single type of contact provides all these different indication functions, depending on where it is inserted in the device. The contacts clip into slots behind the front cover of the circuit breaker.
The SDE function on a Compact NSX100 - 250 DC equipped with a thermal-magnetic trip unit requires the SDE actuator.
■ CAM function: the contact fits into the rotary-handle unit (direct or extended).
■ CE/CD function: the contacts clip into the fixed part of the chassis.

Electrical characteristics of auxiliary contacts

Contacts			Standard				Low level			
Types of contacts			**All**				**OF, SD, SDE**			
Rated thermal current (A)			6				5			
Minimum load			100 mA at 24 V DC				1 mA at 4 V DC			
Utilisation cat. (IEC 60947-5-1)			AC12	AC15	DC12	DC14	AC12	AC15	DC12	DC14
Operational current (A)	24 V	AC/DC	6	6	6	1	5	3	5	1
	48 V	AC/DC	6	6	2.5	0.2	5	3	2.5	0.2
	110 V	AC/DC	6	5	0.6	0.05	5	2.5	0.6	0.05
	220/240 V	AC	6	4	-	-	5	2	-	-
	250 V	DC	-	-	0.3	0.03	5	-	0.3	0.03
	380/440 V	AC	6	2	-	-	5	1.5	-	-
	480 V	AC	6	1.5	-	-	5	1	-	-
	660/690 V	AC	6	0.1	-	-	-	-	-	-

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Electrical and mechanical accessories

Rotary handles

For Compact NSX DC

There are two types of rotary handle:
- direct rotary handle
- extended rotary handle.

There are two models:
- standard with a black handle
- red handle and yellow front for machine-tool control.

PB104936.eps



Compact NSX DC with a rotary handle.

PB103607-50.eps



Compact NSX DC with an MCC rotary handle.

PB103608-50.eps



Compact NSX DC with a CNOMO machine-tool rotary handle.

Direct rotary handle

Standard handle

Degree of protection IP40, IK07.
The direct rotary handle maintains:
- visibility of and access to trip-unit settings
- suitability for isolation
- indication of the three positions O (OFF), I (ON) and tripped
- access to the "push to trip" button.

Device locking
The rotary handle facilitates circuit-breaker locking.
- Padlocking:
  - standard situation, in the OFF position, using 1 to 3 padlocks, shackle diameter 5 to 8 mm, not supplied
  - with a simple modification, in the ON and OFF positions. Locking in the ON position does not prevent free circuit-breaker tripping if a fault occurs. In this case, the handle remains the ON position after the circuit breaker tripping. Unlocking is required to go to the tripped then the OFF position.
- Keylock (and padlock)

It is possible to install a Ronis or Profalux keylock (optional) on the base of the handle to obtain the same functions as with a padlock.

Early-make or early-break contacts (optional)
Early-make and/or early-break contacts may be used with the rotary handle. It is thus possible to:
- supply an MN undervoltage release before the circuit breaker closes
- open the contactor control circuit before the circuit breaker opens.

MCC switchboard control

Control of an MCC switchboard is achieved by adding a kit to the standard handle. In addition to the standard functions, the kit offers the characteristics listed below.

Higher degree of protection IP
Degree of protection IP43, IK07.
The IP is increased by a built-in gasket.

Door locking depending on device position
- The door cannot be opened if the circuit breaker is ON or in the tripped position.

For exceptional situations, door locking can be temporarily disabled with a tool to open the door when the circuit breaker is closed. This operation is not possible if the handle is locked by a padlock.
- Circuit-breaker closing is disabled if the door is open. This function can be deactivated.

Machine-tool control in compliance with CNOMO

Control of a machine-tool is achieved by adding a kit to the standard handle. In addition to the standard functions, the kit offers the characteristics listed below.

Enhanced waterproofness and mechanical protection
- Degree of protection IP54, IK08.
- Compliance with CNOMO E03.81.501N.

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PB104939.eps



Compact NSX DC with an extended rotary handle installed at the back of a switchboard, with the keylock option and key.

PB104940.eps



Extended rotary handle

Degree of protection IP55, IK08.
The extended rotary handle makes it possible to operate circuit breakers installed at the back of switchboards, from the switchboard front.
It maintains:
- visibility of and access to trip-unit settings
- suitability for isolation
- indication of the three positions O (OFF), I (ON) and tripped.

Mechanical door locking when device closed
A standard feature of the extended rotary handle is a locking function, built into the shaft, that disables door opening when the circuit breaker is in the ON or tripped positions.
Door locking can be temporarily disabled with a tool to open the door without opening the circuit breaker. This operation is not possible if the handle is locked by a padlock.

Voluntary disabling of mechanical door locking
A modification to the handle, that can be carried out on site, completely disables door locking, including when a padlock is installed on the handle. The modification is reversible.

When a number of extended rotary handles are installed on a door, this disabling function is the means to ensure door locking by a single device.

Device and door padlocking
Padlocking locks the circuit-breaker handle and disables door opening:
- standard situation, in the OFF position, using 1 to 3 padlocks, shackle diameter 5 to 8 mm, not supplied
- with a simple modification, in the ON and OFF positions. Locking in the ON position does not prevent free circuit-breaker tripping if a fault occurs.

In this case, the handle remains in the ON position after the circuit breaker tripping. Unlocking is required to go to the tripped then the OFF position.
If the door controls were modified to voluntarily disable door locking, padlocking does not lock the door, but does disable handle operation of the device.

Device locking using a keylock inside the switchboard
It is possible to install a Ronis or Profalux keylock (optional) on the base of the rotary handle to lock the device in the OFF position or in either the ON or OFF positions.

Accessory for device operation with the door open
When the device is equipped with an extended rotary handle, a control accessory mounted on the shaft makes it possible to operate the device with the door open.
- The device can be padlocked in the OFF position.
- The accessory complies with UL508.

Early-make or early-break contacts (optional)
The extended rotary handle offers the same possibilities with early-make and/or early-break contacts as the standard rotary handle.

Parts of the extended rotary handles
- A unit that replaces the front cover of the circuit breaker (secured by screws).
- An assembly (handle and front plate) on the door that is always secured in the same position, whether the circuit breaker is installed vertically or horizontally.
- An extension shaft that must be adjusted to the distance. The min/max distance between the back of circuit breaker and door is:
  - 185…600 mm for Compact NSX100 to 250 DC
  - 209…600 mm for Compact NSX400/630 DC.

For withdrawable devices, the extended rotary handle is also available with a telescopic shaft to compensate for device disconnection. In this case, the min/max distances are:
- 248…600 mm for Compact NSX100 to 250 DC
- 272...600 mm for Compact NSX400/630 DC.

PB104937.eps



Manual source-changeover systems

An additional accessory interlocks two devices with rotary handles to create a source-changeover system. Closing of one device is possible only if the second is open.
This function is compatible with direct or extended rotary handles.
Up to three padlocks can be used to lock in the OFF or ON position.

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Electrical and mechanical accessories

Motor mechanism

For Compact NSX DC

PB103372-30.eps



Compact NSX250 DC with motor mechanism.

When equipped with a **motor-mechanism** module, Compact NSX DC circuit breakers feature very high mechanical endurance as well as easy and sure operation:

- all circuit-breaker indications and information remain visible and accessible, including trip-unit settings and indications
- suitability for isolation is maintained and padlocking remains possible
- double insulation of the front face.

A specific motor mechanism is required for operation via the communication function (1). This **communicating motor mechanism** must be connected to the BSCM module to receive the opening and closing orders. Operation is identical to that of a standard motor mechanism.

Applications

- Local motor-driven operation, centralised operation, automatic distribution control.
- Normal/standby source changeover or switching to a replacement source to ensure availability or optimise energy costs.
- Load shedding and reconnection.
- Synchrocoupling.

Operation

The type of operation is selected using the manual/auto mode selection switch (**7**). A transparent, lead-seal cover controls access to the switch.

Automatic

When the switch is in the "auto" position, the ON/OFF (I/O) buttons and the charging lever on the mechanism are locked.

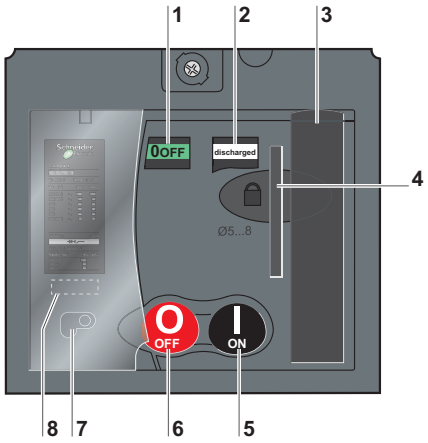
- Circuit-breaker ON and OFF controlled by two impulse-type or maintained signals.
- Automatic spring charging following voluntary tripping (by MN or MX), with standard wiring.
- Mandatory manual reset following tripping due to an electrical fault.

Manual

When the switch is in the "manual" position, the ON/OFF (I/O) buttons may be used. A microswitch linked to the manual position can remote the information.

- Circuit-breaker ON and OFF controlled by 2 pushbuttons I/O.
- Recharging of stored-energy system by pumping the lever 8 times.
- Padlocking in OFF position.

DB111335.eps



1 *Position indicator (positive contact indication)*
2 *Spring status indicator (charged, discharged)*
3 *Manual spring-charging lever*
4 *Keylock device (optional) Locking device (OFF position), using 1 to 3 padlocks, shackle diameter 5 to 8 mm, not supplied*
5 *I (ON) pushbutton*
6 *O (OFF) pushbutton*
7 *Manual/auto mode selection switch. The position of this switch can be indicated remotely.*
8 *Operation counter (Compact NSX400/630 DC).*

Installation and connections

All installation (fixed, plug-in/withdrawable) and connection possibilities are maintained.

Motor-mechanism module connections are made behind its front cover to integrated terminals, for cables up to 2.5 mm².

Optional accessories

- Keylock for locking in OFF position.
- Operations counter for the Compact NSX400/630 DC, indicating the number of ON/OFF cycles. Must be installed on the front of the motor-mechanism module.

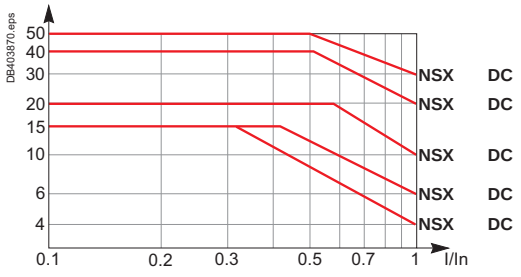
Characteristics

Motor mechanism			MT100 to MT630
Response time (ms)	opening		< 600
	closing		< 80
Operating frequency	cycles/minute max.		4
Control voltage (V)	DC		24/30 - 48/60 - 110/130 - 250
	AC 50/60 Hz		48 (50 Hz) - 110/130 - 220/240 - 380/440
Consumption (2)	DC (W)	opening	≤ 500
		closing	≤ 500
	AC (VA)	opening	≤ 500
		closing	≤ 500

(2) For NSX100 DC to NSX250 DC, the inrush current is 2 In for 10 ms.

Electrical endurance

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Circuit breaker + motor-mechanism module, in thousands of operations (IEC 60947 2), at 440 V.

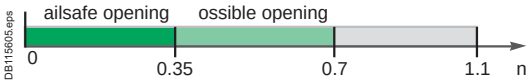
(1) NSX100-250 DC only.

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Remote tripping
For Compact NSX DC



MX or MN voltage release.



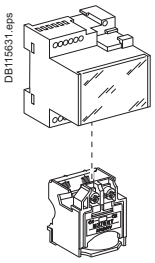
Opening conditions of the MN release.



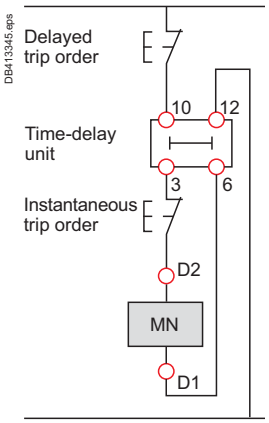
Closing conditions of the MN release.



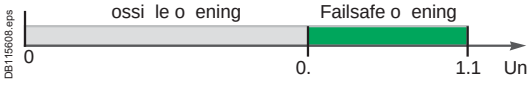
MN voltage release.



MN release with a time-delay unit.



Wiring diagram for emergency-off function with MN + time-delay unit.



Opening conditions of the MX release.

***Note**: circuit breaker opening using an MN or MX release must be reserved for safety functions. This type of tripping increases wear on the opening mechanism. Repeated use reduces the mechanical endurance of the circuit breaker by 50 %.*

MX or MN voltage releases are used to trip the circuit breaker. They serve primarily for remote, emergency-off commands.
It is advised to test the system every six months.

MN undervoltage release

The MN release opens the circuit breaker when its supply voltage drops to a value below 35 % of its rated voltage Un.
Undervoltage tripping, combined with an emergency-off button, provides fail-safe tripping. The MN release is continuously supplied, i.e. if supply is interrupted:
- either voluntarily, by the emergency-off button,
- or accidentally, through loss of power or faulty wiring,

the release provokes opening of the circuit breaker.

Opening conditions

Circuit-breaker tripping by an MN release meets the requirements of standard IEC 60947-2.
- Automatic opening of the circuit breaker is ensured when the continuous voltage supply to the release U ⩽ 0.35 x Un.
- If the supply voltage is between 0.35 and 0.7 Un, opening is possible, but not guaranteed. Above 0.7 Un, opening does not take place.

Closing conditions

If there is no supply to the MN release, it is impossible to close the circuit breaker, either manually or electrically. Closing is ensured when the voltage supply to the release U ⩾ 0.85 x Un. Below this threshold, closing is not guaranteed.

Characteristics

Power supply	V AC	50/60 Hz: 24 - 48 - 100/130 - 200/240
		50 Hz: 380/415 60 Hz: 208/277
	V DC	12 - 24 - 30 - 48 - 60 - 125 -250
Operating threshold	Opening	0.35 to 0.7 Un
	Closing	0.85 Un
Operating range		0.85 to 1.1 Un
Consumption (VA or W)		Pick-up: 10 - Hold: 5
Response time (ms)		50

Time-delay unit for an MN release

A time delay unit for the MN release eliminates the risk of nuisance tripping due to a transient voltage dip lasting ⩽ 200 ms. For shorter micro-outages, a system of capacitors provides temporary supply to the MN at U > 0.7 to ensure non tripping.
The correspondence between MN releases and time-delay units is shown below.

Power supply	Corresponding MN release
Unit with fixed delay 200 ms	
48 V AC	48 V DC
220 / 240 V AC	250 V DC
Unit with adjustable delay ⩽ 200 ms	
48 - 60 V AC/DC	48 V DC
100 - 130 V AC/DC	125 V DC
220 - 250 V AC/DC	250 V DC

MX shunt release

The MX release opens the circuit breaker via an impulse-type (⩾ 20 ms) or maintained order.

Opening conditions

When the MX release is supplied, it automatically opens the circuit breaker. Opening is ensured for a voltage U ⩾ 0.7 x Un.

Characteristics

Power supply	V AC	50/60 Hz: 24 - 48 - 100/130 - 200/240
		50 Hz: 380/415 60 Hz: 208/277
	V DC	12 - 24 - 30 - 48 - 60 - 125 -250
Operating range		0.7 to 1.1 Un
Consumption (VA or W)		Pick-up: 10
Response time (ms)		50

Circuit breaker control by MN or MX

When the circuit breaker has been tripped by an MN or MX release, it must be reset before it can be reclosed.
MN or MX tripping takes priority over manual closing.
In the presence of a standing trip order, closing of the contacts, even temporary, is not possible.
Connection using wires up to 1.5 mm² to integrated terminal blocks.

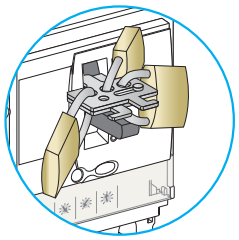
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Electrical and mechanical accessories

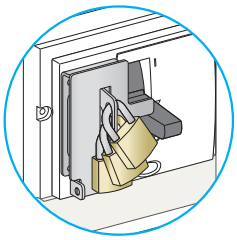
Locks

For Compact NSX DC

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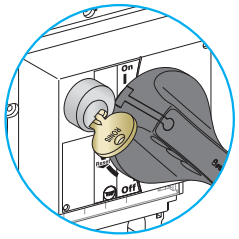


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Toggle locking using padlocks and an accessory: Removable device *Fixed device attached to the case.*

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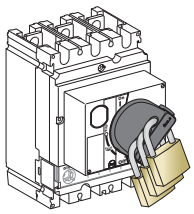
Rotary-handle locking using a keylock.

Locking in the OFF position guarantees isolation as per IEC 60947-2. Padlocking systems can receive up to three padlocks with shackle diameters ranging from 5 to 8 mm (padlocks not supplied). Certain locking systems require an additional accessory.

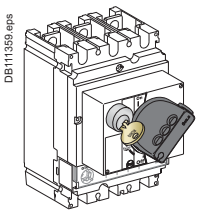
Control device		Function	Means	Required accessories
Toggle		Lock in OFF position	Padlock	Removable device
		Lock in OFF or ON position	Padlock	Fixed device
Direct rotary handle	Standard	Lock in ■ OFF position ■ OFF or ON position (1)	Padlock	-
			Keylock	Locking device + keylock
	MCC	Lock in ■ OFF position ■ OFF or ON position (1)	Padlock	-
	CNOMO	Lock in ■ OFF position ■ OFF or ON position (1)	Padlock	-
Extended rotary handle		Lock in ■ OFF position ■ OFF or ON position (1) with door opening prevented (2)	Padlock	-
		Lock in OFF position	Padlock	UL508 control accessory
		■ OFF or ON position (1) inside the switchboard	Keylock	Locking device + keylock
Motor mechanism		Lock in OFF position remote operation disabled	Padlock	-
			Keylock	Locking device + keylock
Withdrawable circuit breaker		Lock in ■ disconnected position	Padlock	-
			Keylock	Locking device + keylock
		■ connected position	Keylock	Locking device + keylock

(1) Following a simple modification of the mechanism.
(2) Unless door locking has been voluntarily disabled.

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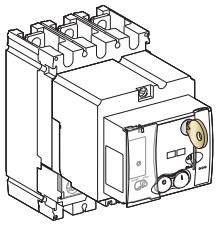


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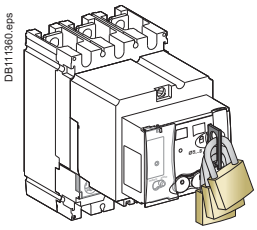


Rotary-handle locking using a padlock or a keylock.

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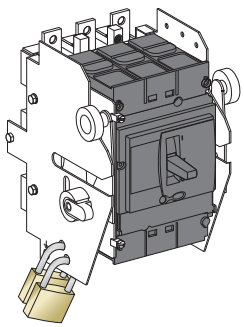


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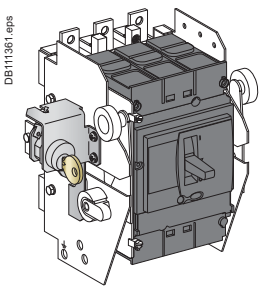


Motor-mechanism locking using a padlock or a keylock.

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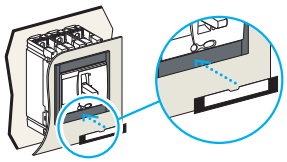
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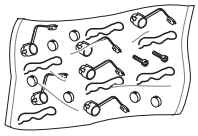
Chassis locking in the connected position.

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Sealing accessories
For Compact NSX DC



Identification accessories.



Sealing accessories.

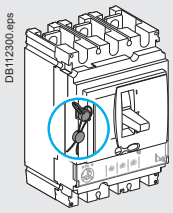
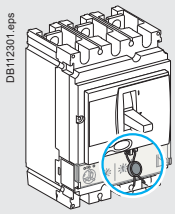
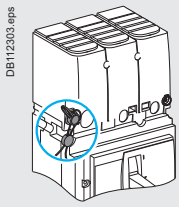
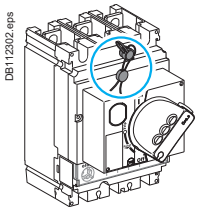
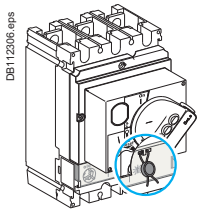
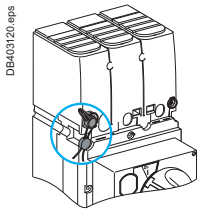
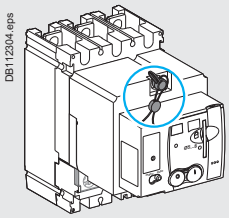
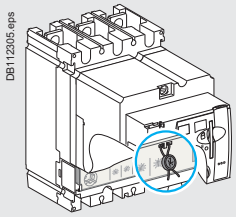
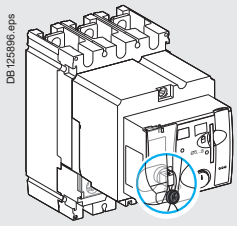
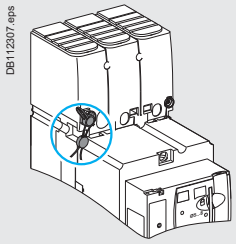
Outgoing-circuit identification

Compact NSX100 to 630 DC can be equipped with label holders supplied in sets of ten (cat. no. LV429226).
They are compatible with escutcheons.

Sealing accessories

Sealing accessories are available. Each bag of accessories contains all the parts required for the types of sealing indicated below.
A bag contains:
- 6 sealing accessories
- 6 lead seals
- 0.5 m of wire
- 2 screws.

Types of seals and corresponding functions

Toggle control				
Rotary handle				
Motor mechanism				
Types of seals	**Front-cover fixing screw**	**Trip-unit transparent cover**	**Motor-mechanism transparent cover**	**Terminal-shield fixing screw**
Protected operations	■ front removal ■ access to auxiliaries ■ trip-unit removal.	■ modification of settings ■ access to test connector.	■ access to manual/auto mode selection switch: depending on its position, manual (1) or automatic operation is not possible. *(1) In this case, local operation is not possible.*	■ access to power connections (protection against direct contact).

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Electrical and mechanical accessories

Escutcheons and protection collars

For Compact NSX DC

Escutcheons are an optional feature mounted on the switchboard door. They increase the degree of protection to IP40, IK07. Protection collars maintain the degree of protection, whatever the position of the device (connected, disconnected).

IP30 or IP40 escutcheons for fixed devices

IP30

The three types are glued to the cut-out in the front door of the switchboard:
- ■ escutcheon for all control types (toggle, rotary handle or motor mechanism)
- □ without access to the trip unit
- □ with access to the trip unit.

IP40

The four types, with a gasket, are screwed to the door cut-out:
- ■ three escutcheons identical to the previous, but IP40
- ■ a wide model for Vigi and ammeter modules that can be combined with the above.

PB104942.eps



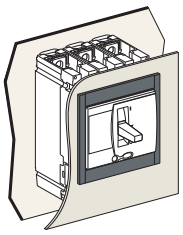
IP30 escutcheon.

PB104938.eps

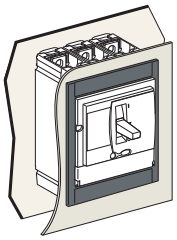


IP30 escutcheon with access to the trip unit.

DB112290.eps



DB402617.eps



Escutcheon for toggle without and with access to the trip unit.

For reference only. www.fengshengelectric.com.sg

IP40 escutcheons for withdrawable devices

IP40 for withdrawable devices

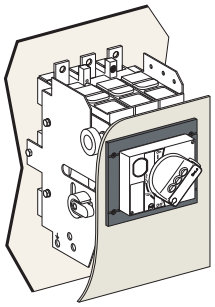
The two types, with a gasket, are screwed to the door cut-out:
- for rotary handle or motor mechanism: standard IP40 escutcheon
- for toggle with extension: standard escutcheon + collar for withdrawal.

PB103777-36.eps



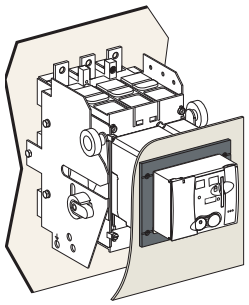
Escutcheon with collar for toggle.

DB112294.eps



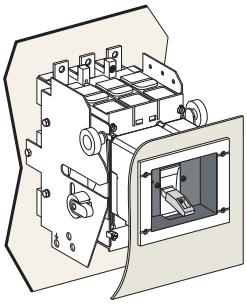
Standard escutcheon with rotary handle.

DB112295.eps



Standard escutcheon for motor mechanism.

DB112296.eps



Standard escutcheon with collar for withdrawal, for toggle.

IP43 toggle cover

Available only for devices with toggles. Fits over toggle and front cover of the device.
- Mounted on the front of the circuit breaker.
- Degree of protection IP43, IK07.

PB103775-40.eps



Toggle cover.

DB112218.eps



Toggle cover.

Retrofit front covers

These replacement front covers make it possible to install NSX DC devices in existing switchboards containing NSX devices by installing the NSX-type retrofit covers on the NSX DC devices.
- NSX100 to 250 DC cover.
- NSX400/630 DC cover.

PB103820_35.eps



NSX retrofit front cover.

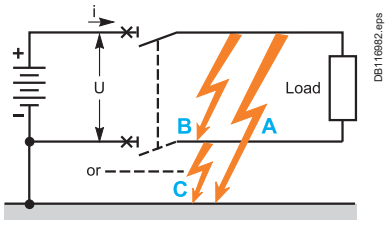
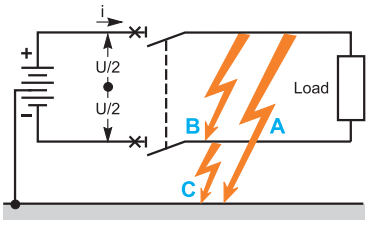
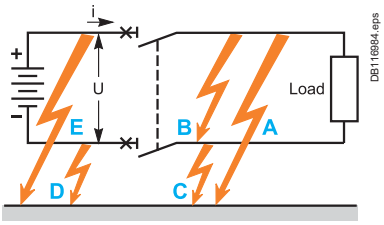
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Selection guide for DC circuit breakers

Types of DC distribution systems

There are three types of DC distribution systems (see the table).
The operational voltage in conjunction with one of the three systems determines the number of poles taking part in current interruption.

Selection of a circuit breaker depends essentially on the distribution-system parameters presented below which are used to determine the corresponding characteristics:
- type of system - determines the type of product and the number of poles connected in series for each polarity
- rated voltage - determines the number of series poles taking part in current interruption
- nominal current - determines the rated current of the circuit-breaker
- maximum short-circuit current at the point of installation - determines the breaking capacity.

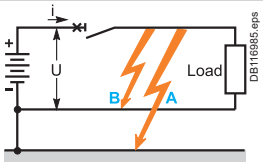
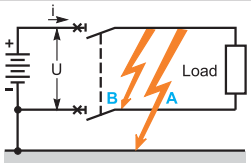
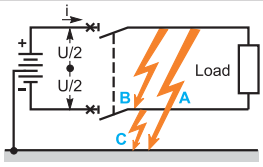
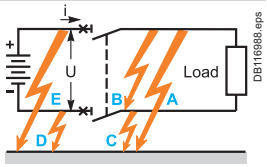
Types of systems	Earthed systems		Isolated systems
	The source has one earthed polarity (1)	The source has an earthed mid-point	
Diagrams and different faults			
Fault analysis (neglecting resistance of earth electrodes)			
Fault A	■ maximum Isc at U ■ only protected polarity concerned ■ all poles of protected polarity must have breaking capacity ≥ Isc max. at U	■ maximum Isc at U/2 ■ only positive polarity concerned ■ all poles of positive polarity must have breaking capacity ≥ Isc max. at U/2	■ no consequences ■ the fault must be indicated by an IMD (insulation-monitoring device) and cleared (standard IEC/EN 60364)
Fault B	■ maximum Isc at U ■ if only one polarity (the positive here) is protected, all poles of protected polarity must have breaking capacity ≥ Isc max. at U ■ if both polarities are protected, to enable disconnection, all poles of the two polarities must have breaking capacity ≥ Isc max. at U	■ maximum Isc at U ■ both polarities are concerned ■ all poles of the two polarities must have breaking capacity ≥ Isc max. at U	■ maximum Isc at U ■ both polarities are concerned ■ all poles of the two polarities must have breaking capacity ≥ Isc max. at U
Fault C	No consequences	■ same as fault A ■ all poles of the negative polarity must have breaking capacity ≥ Isc max. at U/2	■ same as fault A with the same obligations
Double fault A and D or C and E	Double fault not possible, system trips on first fault	Double fault not possible, system trips on first fault	■ maximum Isc at U ■ only positive polarity (cases A and D) or negative (C and E) concerned ■ all poles of each polarity must have breaking capacity ≥ Isc max. at U
Most unfavourable cases			
	Fault A and fault B (if only one polarity is protected)	Fault B	Double fault A and D or C and E
Conclusion: selection of number of poles and breaking capacity			
Layout of protection poles			
	■ on only one polarity (1)	■ identical for each polarity	■ identical for each polarity
Number of series poles			
Per polarity	■ all on same polarity	■ equal	■ equal
Total	■ 1, 2 or 3 without disconnection ■ 2, 3 or 4 with disconnection	■ 2 or 4 (2)	■ 2 or 4 (2)
Breaking capacity			
	■ all poles of the protected polarity ≥ Isc max. at U	■ all poles of both polarities ≥ Isc max. at U ■ all poles of each polarity ≥ Isc max. at U/2	■ all poles of each polarity ≥ Isc max. at U
Disconnection of both polarities (3)			
	Possible by adding a pole to the non-protected polarity	■ ensured	■ ensured
Implementation			
	See the selection table opposite		

(1) Positive or negative, depending on the polarity connected to the exposed conductive parts.
(2) A 3P circuit breaker can be used if a 2P version does not exist. In this case, the central pole is not connected.
(3) Disconnection made possible by multi-pole breaking.

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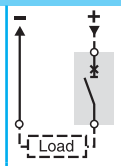
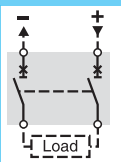
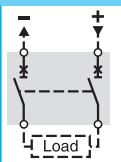
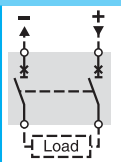
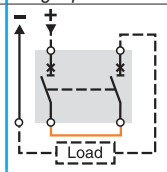
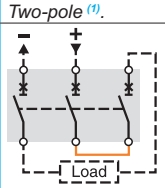
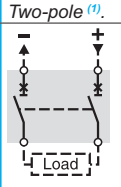
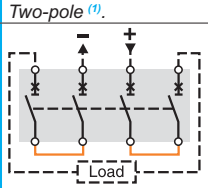
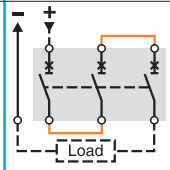
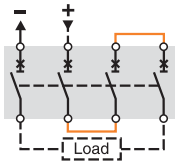
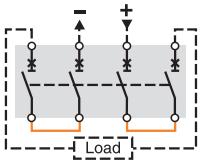
Series connection of poles

Type of distribution system

Type	Earthed			Isolated
Source	One polarity (negative here) connected to earth (or exposed conductive parts)		Mid-point connected to earth	Isolated polarities
Protected polarities	1 (disconnection of 1P)	2 (disconnection of 2P)	2	2
Diagrams (and types of faults)				

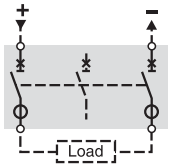
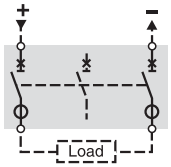
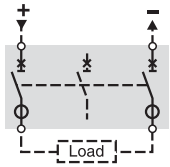
Selection of circuit breaker and pole connection

Compact NSX DC

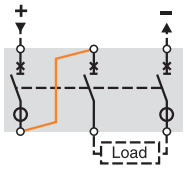
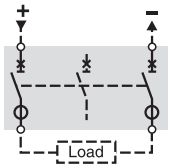
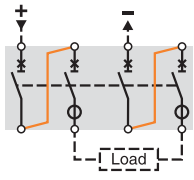
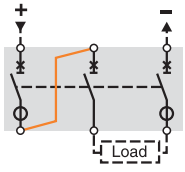
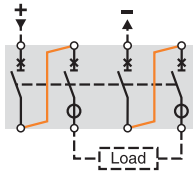
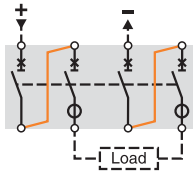
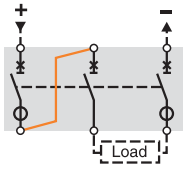
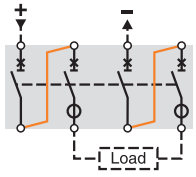
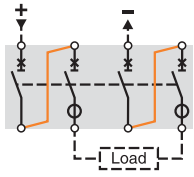
24 V ≤ Un ≤ 250 V	 *Single-pole.*	 *Two-pole (1).*	 *Two-pole (1).*	 *Two-pole (1).*
250 V < Un ≤ 500 V	 *Two-pole (1).*	 *Three-pole.*	 *Two-pole (1).*	 *Four-pole.*
500 V < Un ≤ 750 V	 *Three-pole.*	 *Four-pole.*	 *Four-pole.*	

Masterpact NW DC

Type N

24 V ≤ Un ≤ 500 V		 *Version C.*	 *Version C.*	 *Version C.*

Type H

24 V ≤ Un ≤ 500 V		 *Version D.*	 *Version C.*	 *Version E.*
500 V < Un ≤ 750 V		 *Version D.*	 *Version E.*	 *Version E.*
750 V < Un ≤ 900 V		 *Version D.*	 *Version E.*	 *Version E.*

(1) A 3P circuit breaker can be used if a 2P version does not exist. In this case, the central pole is not connected.

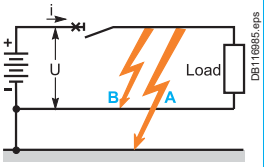
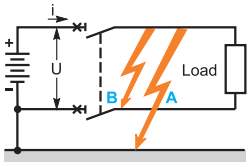
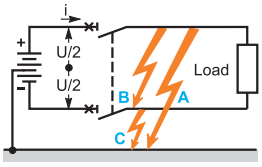
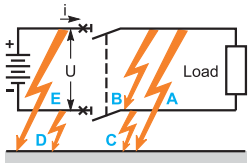
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Selection guide for DC circuit breakers

Solutions depending on the distribution system and the voltage

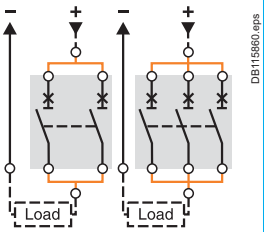
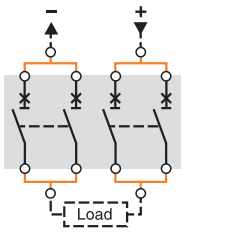
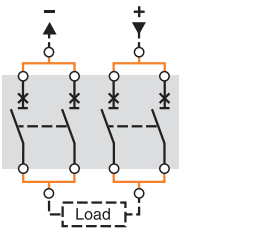
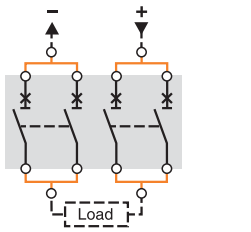
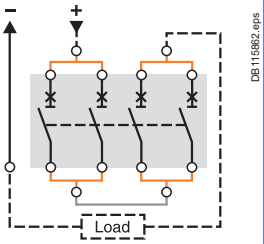
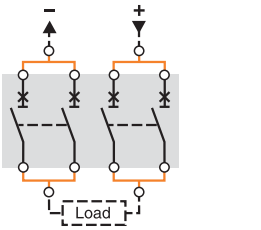
Parallel connection of poles

Type of distribution system

Type	Earthed			Isolated
Source	One polarity (negative here) connected to earth (or exposed conductive parts)		Mid-point connected to earth	Isolated polarities
Protected polarities	1 (disconnection of 1P)	2 (disconnection of 2P)	2	2
Diagrams (and types of faults)	 DB116885.eps	 DB116886.eps	 DB116887.eps	 DB116988.eps

Selection of circuit breaker and pole connection

Compact NSX DC

Un ≤ 250 V	 DB115860.eps *Two, three-pole, 2, 3P in parallel, four-pole, 4P in parallel.*	 DB115861.eps *Four-pole, 2 x 2P in parallel.*	 DB115861.eps *Four-pole, 2 x 2P in parallel.*	 DB115861.eps *Four-pole, 2 x 2P in parallel.*
250 V < Un ≤ 500 V	 DB115862.eps *Four-pole, 2 x 2P in parallel, connected in series.*		 DB115861.eps *Four-pole, 2 x 2P in parallel.*	

Breaking capacity of parallel solutions

		Un ≤ 250 V			250 V < Un ≤ 500 V		
		N	H	DC	N	H	DC
Two-pole	2 poles in parallel	85	100	-	-	-	-
Three-pole	3 poles in parallel	-	-	100	-	-	-
Four-pole	4 poles in parallel	-	-	100	-	-	-
	2 x 2 poles in parallel, connected in series	-	-	100	-	-	100

Comparison of series and parallel connection in terms of performance

Series connection of poles divides the voltage per pole and optimises breaking capacity for high-voltage systems.

Series connection of poles on a DC circuit breaker is the means to:
- divide the system voltage by the number of poles
- use the rated current for each pole
- use the breaking capacity of the circuit breaker for all the poles.

For example, a Compact NSX630, 3P DC type, with the three poles connected in series, provides:
- a maximum voltage of 750 V (250 V per pole)
- a rated current of 630 A
- a breaking capacity of 100 kA / 750 V.

Consequently, a 630 A / 250 V device can be used in a 750 V system.

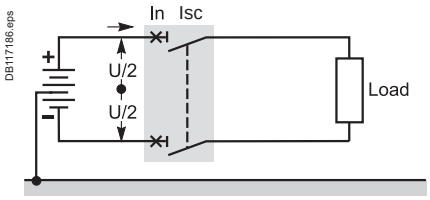
Parallel connection of poles divides the current per pole and optimises the rated current for systems that do not exceed the withstand voltage of each pole. The maximum useable rating and the value of the magnetic setting are indicated (see page B-7).

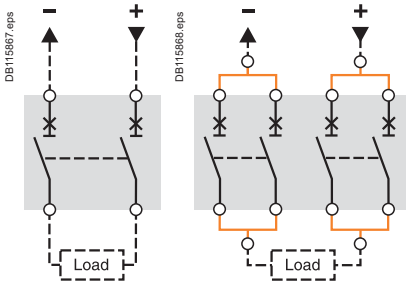
Parallel connection of poles, on the contrary, imposes the system voltage on each pole, but is the means to:
- divide the current flowing through each pole by the number of poles
- increase the rated current.

For example, the same Compact NSX630 DC 3P circuit breaker with three poles in parallel provides:
- a maximum voltage of 250 V (250 V per pole)
- a rated current of 1500 A (see table page B-7)
- a breaking capacity of 100 kA / 250 V.

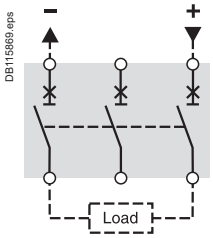
Consequently, a 630 A device used in a 250 V system can handle 1500 A.

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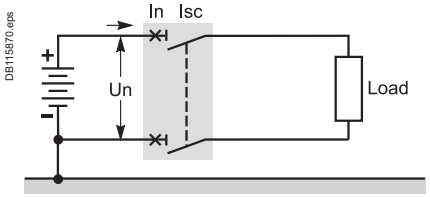


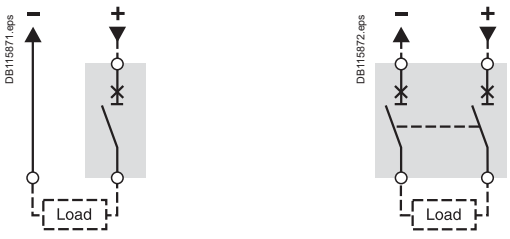


Selection 1. *Selection 2: Compact NSX160 DC 4P 2 x 2P parallel mounted in series.*

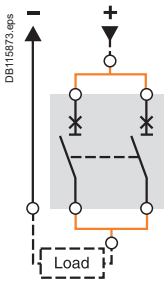


Selection 3: Compact NSX250 DC 3P with 2P connected.





Selection 1: Compact NSX160N DC 1P. *Selection 2.*



Selection 3: Compact NSX100N 2P DC in parallel.

Selection of a Compact NSX DC

Example 1

- type of system - mid-point connected to earth
- system voltage - Un = 500 V DC with time constant L/R = 5 ms
- rated current required at point of installation In = 250 A
- short-circuit current at the point of installation Isc = 60 kA

Selection constraints - (see page A-30)
The system with the mid-point connected to earth requires (see conclusion page A-30):
- identical protection-pole layout for each polarity
- an equal number of poles for each polarity, i.e. a total of two or four
- all poles of the two polarities must have breaking capacity ⩾ Isc max. at Un, i.e. 60 kA/500 V in this case
- all poles of the each polarity must have breaking capacity ⩾ Isc max. at Un/2, i.e. 60 kA/250 V in this case.

Selection possibilities - (see page A-31) and (see page A-32)
The tables indicate for 250 V < Un ⩽ 500 V and for this system:
- poles connected in series: two-pole 2P in series ➡ **selection 1**
- poles connected in parallel: four-pole 2 x 2P parallel connected in series ➡ **selection 2**.

Circuit-breaker selection - (see page A-4) and (see page B-7)
- **selection 1**: the 250 A rated current does not exist in 2P. It is possible to use a 250 A 3P DC type circuit breaker with the central pole not connected ➡ **selection 3**
- **selection 2**: the 160 A rated current (DC version) is suitable with a 2 x 2P assembly connected in parallel because (see table page B-7):
  - ◻ the rated current of the 2 x 2P assembly connected in parallel is In = 288 A > 250 A
  - ◻ and for L/R = 5 ms:
  - breaking capacity of all poles = 100 kA/750 V > 60 kA/500 V
  - breaking capacity of poles of each polarity = 100 kA/250 V > 60 kA/250 V.

The options are:
- **selection 1**: Compact S250DC, 3P, 2 poles connected
- **selection 3**: Compact NSX160 DC, 4P, 2 x 2P parallel connected in series.

Both solutions exist in fixed and withdrawable configurations.

Trip-unit selection
- Compact NSX250 DC 3P: the selection table (see page A-6) indicates 3 TM250DC trip units, which are interchangeable
- Compact NSX160 DC, 4P (2 x 2P) 160 A: the selection table (see page B-7) indicates, for the 2 x 2P parallel configuration mounted in series and for 250 A, a TM125DC trip unit with the magnetic-protection threshold set to 2500 A.

Example 2

- type of system - one polarity earthed
- system voltage - Un = 250 V DC with time constant L/R = 5 ms
- rated current required at point of installation In = 160 A
- short-circuit current at the point of installation Isc = 45 kA.

Selection constraints - (see page A-30)
The system with one polarity connected to earth requires (see conclusion page A-30):
- protection poles on the protected polarity
- all poles contribute to breaking for the polarity:
  - ◻ 1, 2 or 3P without disconnection of the two polarities
  - ◻ 2, 3 or 4P with disconnection of the two polarities
- all poles of the protected polarity must have breaking capacity ⩾ Isc max. at Un, i.e. 45 kA/250 V in this case.

Selection possibilities - (see page A-31) and (see page A-32)
The tables indicate for 250 V < Un ⩽ 250 V and for this system:
- poles connected in series: single-pole ➡ **selection 1** (or two-pole with disconnection ➡ **selection 2**)
- poles connected in parallel: two-pole ➡ **selection 3**
- other selections (parallel connection) are possible, but are of no particular interest.

Circuit-breaker selection - (see page A-4) and (see page B-7)
- **selection 1**: Compact NSX160N DC, 1P, 50 kA, available in fixed version (or **selection 2**: Compact NSX160N DC, 2P, 85 kA, if disconnection of the two polarities is desired)
- **selection 3**: Compact NSX100N DC, 2P in parallel, 50 kA, providing a rated current of 200 A (see table page B-7), available in fixed version.

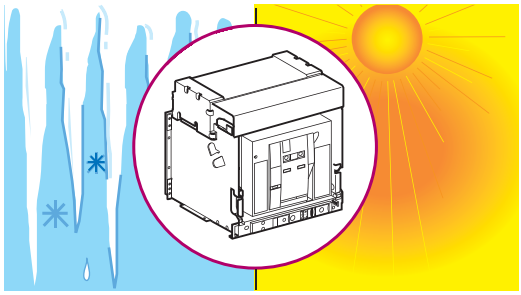
Trip-unit selection
- Compact NSX160N DC, 1P: the selection table (see page A-6) indicates a built-in TM160DC trip unit with the magnetic-protection threshold set to 1250 A
- Compact NSX100N DC, 2P in parallel: the selection table (see page B-7) indicates, for the 2P parallel configuration and for 160 A, a TM80D trip unit with the magnetic-protection threshold set to 1600 A.

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General characteristics of Masterpact DC
Operating conditions

Masterpact circuit breakers have been tested for operation in industrial atmospheres. It is recommended that the equipment be cooled or heated to the proper operating temperature and kept free of excessive vibration and dust.

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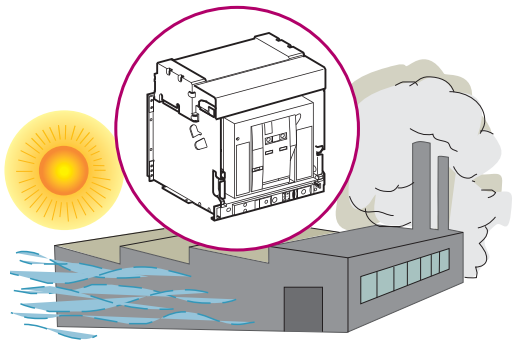


Ambient temperature

Masterpact DC devices can operate under the following temperature conditions:
- the electrical and mechanical characteristics are stipulated for an ambient temperature of -5 °C to +70 °C
- circuit-breaker closing is guaranteed down to -35 °C by manual operation (push button).

Storage conditions are as follows:
- -40 to +85 °C for a Masterpact device without its control unit
- -25 °C to +85 °C for the control unit.

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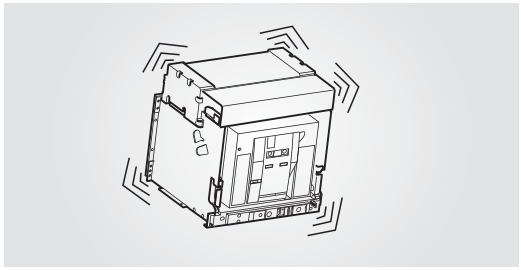


Extreme atmospheric conditions

Masterpact DC devices have successfully passed the tests defined by the following standards for extreme atmospheric conditions:
- IEC 60068-2-1: dry cold at -55 °C
- IEC 60068-2-2: dry heat at +85 °C
- IEC 60068-2-30: damp heat (temperature +55 °C, relative humidity 95 %)
- IEC 60068-2-52 level 2: salt mist.

Masterpact DC devices can operate in the industrial environments defined by standard IEC 60947 (pollution degree up to 4).
It is nonetheless advised to check that the devices are installed in suitably cooled switchboards without excessive dust.

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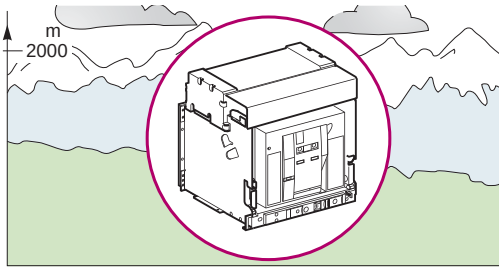


Vibrations

Masterpact DC devices have successfully passed testing in compliance with IEC 60068-2-6 for the following vibration levels:
- 2 to 13.2 Hz: amplitude ± 1 mm
- 13.2 to 100 Hz: constant acceleration 0.7 g.

Vibration testing to these levels is required by merchant marine inspection organisations (Veritas, Lloyd's, etc). Some applications have vibration profiles outside of this standard and require special attention during application design, installation, and use. Excessive vibration may cause unexpected tripping, damage to connections or to other mechanical parts. Please refer to the Masterpact DC maintenance guide (causes of accelerated ageing / operating conditions / vibrations) for additional information.
Examples of applications with high vibration profiles could include:
- wind turbines
- power frequency converters that are installed in the same switchboard or close proximity to the Masterpact DC circuit breaker
- emergency generators
- high vibration marine applications such as thrusters, anchor positioning systems, etc.

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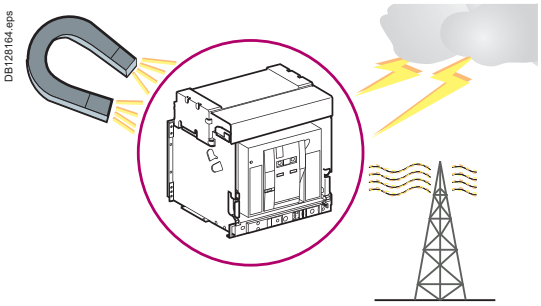


Altitude

At altitudes higher than 2000 metres, the modifications in the ambient air (electrical resistance, cooling capacity) lower the following characteristics as follows:

Altitude (m)		2000	3000	4000	5000
Impulse withstand voltage Uimp (kV)		12	11	10	8
Rated insulation voltage (Ui)		1000	900	780	700
Maximum rated operationnal voltage 50/60 Hz Ue (V)	NT, NW except H10	690	690	630	560
	NW H10	1000	890	795	700
Rated current 40 °C		1 x In	0.99 x In	0.96 x In	0.94 x In

Intermediate values may be obtained by interpolation.



Electromagnetic disturbances

Masterpact DC devices are protected against:
- overvoltages caused by devices that generate electromagnetic disturbances
- overvoltages caused by atmospheric disturbances or by a distribution-system outage (e.g. failure of a lighting system)
- devices emitting radio waves (radios, walkie-talkies, radar, etc.)
- electrostatic discharges produced by users.

Masterpact devices have successfully passed the electromagnetic-compatibility tests (EMC) defined by the following international standards:
- IEC 60947-2, appendix F
- IEC 60947-2, appendix B (trip units with earth-leakage function).

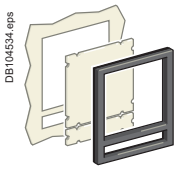
The above tests guarantee that:
- no nuisance tripping occurs
- tripping times are respected.

Degree of protection

Masterpact NW DC circuit breakers offer the following protection characteristics depending on the installation conditions:
- IP: degree of protection (standard IEC 60529)
- IK: protection against external mechanical impacts (standard EN 50102).

Masterpact NW DC

Circuit breaker installed in a switchboard



Bare circuit breaker	IP30	
Escutcheon (CDP) for fixed and drawout versions, with blanking plate	IP40	IK07



Transparent cover (CCP) for escutcheon for fixed and drawout versions	IP54	IK10

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General characteristics of Masterpact DC

Masterpact NW10 to NW40 DC

PB104917.eps



NW10DC 3P.

PB105024_42.eps



NW10DC 4P.

Masterpact DC circuit breaker					
Poles coupling version					C or D (3 poles)
					E (4 poles)
Electrical characteristics as per IEC 60947-1/ 60947-2 and EN 60947-1 / 60947-2					
Rated current at 40 °C / 50 °C (1)		**In**	(A)		
Rated insulation voltage		**Ui**	(V)		
Rated impulse withstand voltage		**Uimp**	(kV peak)		
Rated operational voltage		**Ue**	(V DC)		
Type of circuit breaker					
Ultimate breaking capacity	L/R = 5 ms	**Icu**	(kA)	V DC	500
					750
					900
	L/R = 15 ms	**Icu**			500
					750
					900
	L/R = 30 ms	**Icu**			500
					750
					900
Service breaking capacity		**Ics**	% Icu		
Rated making capacity		**Icm**	% Icu		
Short-time withstand current		**Icw**	1 s		
Utilisation category					
Breaking time			(ms)		
Making time			(ms)		
Suitability for isolation					
Pollution degree (as per IEC 60664-1)					
Protection against overcurrents (see trip-unit table page A-38)					
Trip units					Built-in
Protection					Overloads
					Short-circuits
Durability					
(O/C cycles)	Mechanical	With maintenance			
		Without maintenance			
	Electrical	Without maintenance			500 V DC
					900 V DC
Indication and control auxiliaries					
Auxiliary contacts					
Voltage release		MX shunt release			
		MN undervoltage release			
Characteristics of switch-disconnectors as per IEC 60947-3 and EN 60947-3					
Type of switch-disconnector					
Rated making capacity		**Icm**	(kA)		
Rated short-time withstand current		**Icw**	(kA)		1 s
Installation and connections					
Connection	Drawout	3P	RC		Horizontal
		4P			Vertical
	Fixed	3P	RC		Horizontal
		4P			Vertical
Dimensions and weight					
Dimensions H x W x D (mm) connected in series	Drawout	3P			
		4P			
	Fixed	3P			
		4P			
Weight (kg) connected in series (approximate values)	Drawout	3P			
		4P			
	Fixed	3P			
		4P			

(1) 50 °C - see the derating table for the NW40 DC.

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	NW10 DC		NW20 DC		NW40 DC	
	■		■		■	
	■		■		■	
	1000		2000		4000	
	1000		1000		1000	
	12		12		12	
	500/900		500/900		500/900	
	N	**H**	**N**	**H**	**N**	**H**
	85	100	85	100	85	100
	-	85	-	85	-	85
	-	85	-	85	-	85
	35	85	35	85	35	85
	-	50	-	50	-	50
	-	35	-	35	-	35
	25	50	25	50	25	50
	-	50	-	50	-	50
	-	25	-	25	-	25
	100 %					
	100 %					
	50	85	50	85	50	85
	B					
	30 to 75					
	< 70					
	■	■	■	■	■	■
	4					
	■	■	■	■	■	■
	-	-	-	-	-	-
	■	■	■	■	■	■
	20000					
	10000					
	8500		5000		2000	
	-	2000	-	2000	-	1000
	■	■	■	■	■	■
	■	■	■	■	■	■
	■	■	■	■	■	■
		HA		**HA**		**HA**
	-	85	-	85	-	85
	-	85	-	85	-	85
	■	■	■	■	-	-
	■	■	■	■	■	■
	■	■	■	■	-	-
	■	■	■	■	■	■
	439 x 441 x 494				439 x 441 x 594	
	439 x 556 x 494				439 x 556 x 594	
	352 x 422 x 427				352 x 422 x 527	
	352 x 537 x 427				352 x 537 x 527	
	90 to 116					
	125 to 146					
	60 to 86					
	85 to 106					

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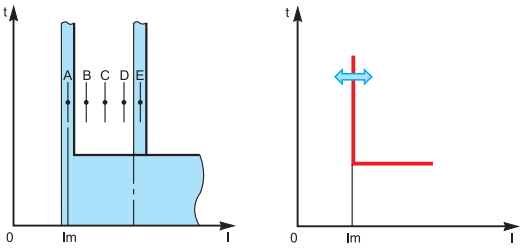
Trip-unit characteristics
Trip units for Masterpact NW DC

All Masterpact NW DC devices
are equipped with a Micrologic 1.0 DC control unit.

PB101139-32R.eps



DB402618.eps



Magnetic pick-up value.

Protection using the Micrologic 1.0 DC control unit

Masterpact NW DC circuit breakers use Micrologic 1.0 DC control units. These interchangeable units with instantaneous thresholds, operating with electromagnetic sensors, can be adjusted on site.
The circuit breakers can be used with the three versions of sensors, defined by their setting range.

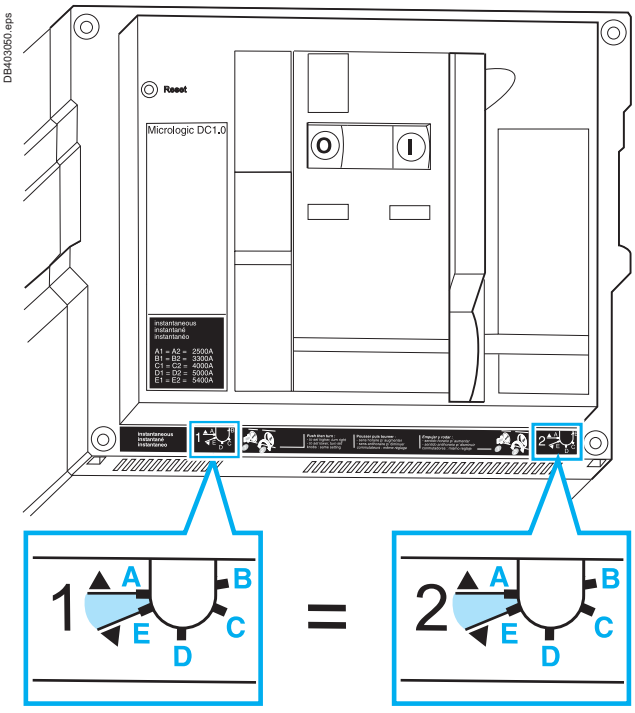
Type of sensor	1250/2500 A	2500/5400 A	5000/11000 A
Masterpact NW10 DC	■	■	■
Masterpact NW20 DC	-	■	■
Masterpact NW40 DC	-	-	■

Adjustments

Settings for Masterpact NW DC circuit breakers may be accessed from the front, with the switchboard door open.

- Settings are made for the input (+ pole) and the output (- pole).
- The setting range comprises eleven positions, plus five preferential settings marked **A**, **B**, **C**, **D** and **E**.
- The setting values for the two corresponding sensors must be identical.

DB403050.eps



Two identical settings.

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DB104542.eps

instantaneous
instantané
instantaneo :

$A_1 = A_2 =$	2500A
$B_1 = B_2 =$	3300A
$C_1 = C_2 =$	4000A
$D_1 = D_2 =$	5000A
$E_1 = E_2 =$	5400A

Setting values for magnetic pick-up Im

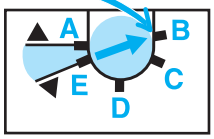
Settings marked A, B, C, D and E

	Minimum				Maximum
Sensor versions	Settings A1 and A2	Settings B1 and B2	Settings C1 and C2	Settings D1 and D2	Settings E1 and E2
1250/2500	1250 A	1500 A	1600 A	2000 A	2500 A
2500/5400	2500 A	3300 A	4000 A	5000 A	5400 A
5000/11000	5000 A	8000 A	10000 A	11000 A	11000 A
Tolerances	±8 %	±10 %	±10 %	±10 %	±10 %

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instantaneous
instantané
instantaneo :

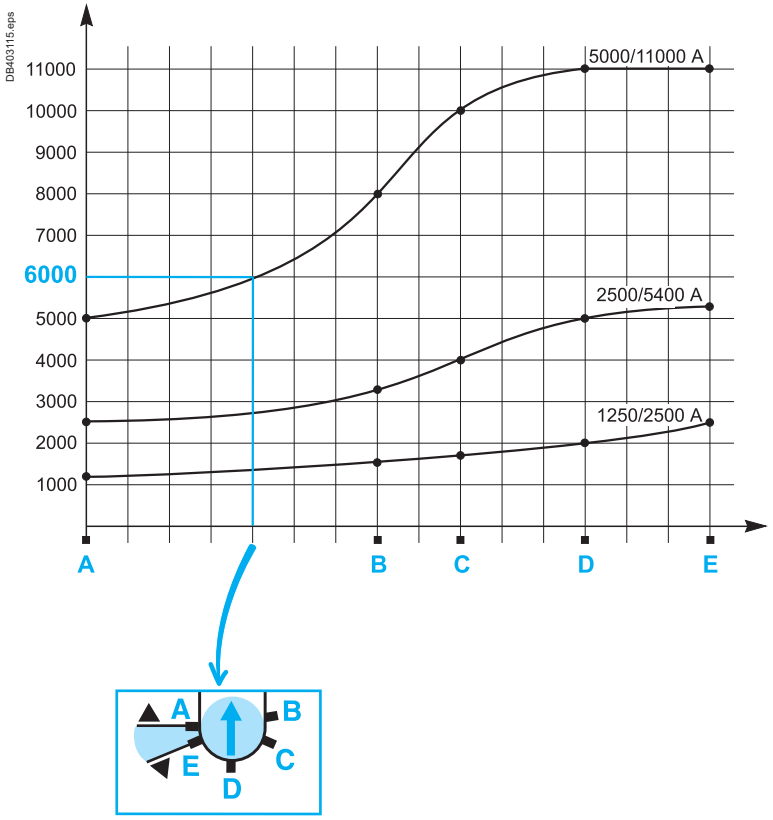
$A_1 = A_2 =$	5000A
$B_1 = B_2 =$	8000A
$C_1 = C_2 =$	10000A
$D_1 = D_2 =$	11000A
$E_1 = E_2 =$	



Intermediate settings

It is possible to set eleven other (unmarked) intermediate values.

DB403115.eps



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Communication
COM option in Masterpact NW DC

The COM option is required for integration of the circuit breraker or switch disconnector in a supervision system.
Masterpact uses the Modbus communications protocol for full compatibility with the ION enterprise. An external gateway is available for communication on other networks:
- Profibus
- Ethernet.

PB106674-20.eps



Modbus BCM ULP "device" communication module.

PB100802B-27.eps



Modbus CCM "chassis" communication module.

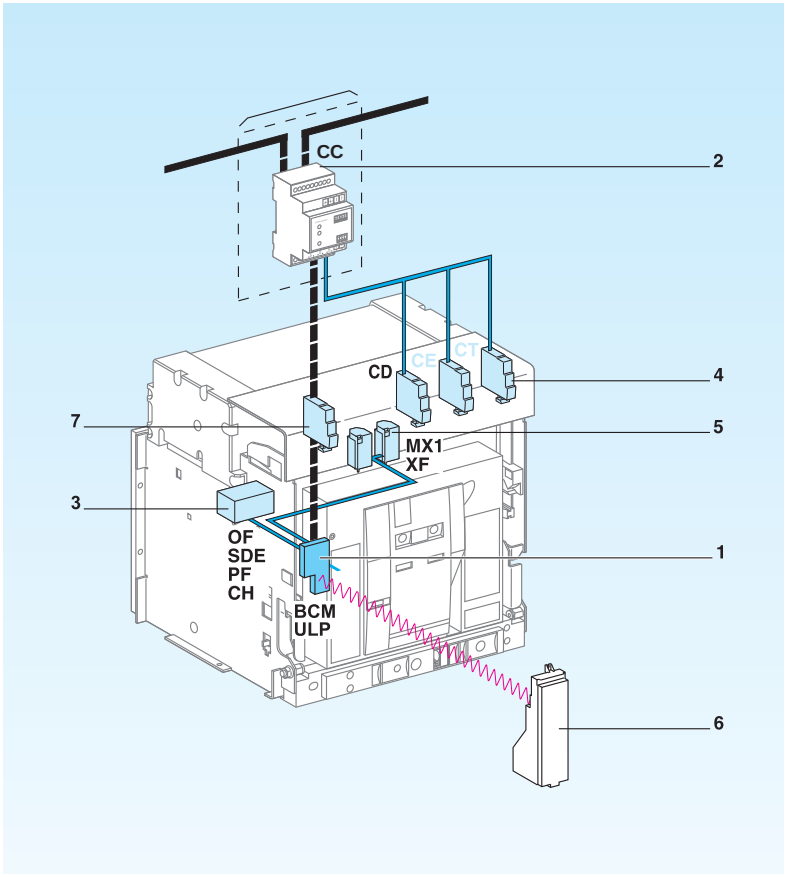
For fixed devices, the COM option is made up of:
■ a Modbus BCM ULP "device" communication module, installed behind the Micrologic control unit and supplied with its set of sensors (OF, SDE ,PF and CH micro switches) its kit for connection to XF and MX1 communicating voltage releases and its COM terminal block (inputs E1 to E6).
For drawout devices, the COM option is made up of:
■ a Modbus BCM ULP "device" communication module, installed behind the Micrologic control unit and supplied with its set of sensors (OF, SDE, PF and CH micro switches) its kit for connection to XF and MX1 communicating voltage releases and its COM terminal block (inputs E1 to E6).
■ a "chassis" communication module supplied separately with its set of sensors (CE, CD and CT contacts) Modbus CCM.
Status indication by the COM option is independent of the device indication contacts. These contacts remain available for conventional uses.

Modbus BCM ULP "Device" communication module
This module is independent of the control unit. It receives and transmits information on the communication network. An infra-red link transmits data between the control unit and the communication module.
Consumption: 30 mA, 24 V.

Modbus CCM "chassis" communication module
This module is independent of the control unit. With Modbus "chassis" communication module, this module makes it possible to address the chassis and to maintain the address when the circuit breaker is in the disconnected position.
Consumption: 30 mA, 24 V.

XF and MX1 communicating voltage releases
The XF and MX1 communicating voltage releases are equipped for connection to the "device" communication module.
The remote-tripping function (MX2 or MN) are independent of the communication option. They are not equipped for connection to the "device" communication module.

DB402049.eps



1 *Modbus BCM ULP "Device" communication module.*
2 *Modbus CCM "Chassis" communication module (option).*
3 *OF, SDE, PF and CH micro switches.*
4 *CE, CD and CT contacts.*
5 *XF and MX1 communicating voltage releases.*
6 *Micrologic control unit.*
7 *COM terminal block (E1 to E6).*

: Hard wire.
: Modbus.

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Four functional levels
The Masterpact can be integrated into a Modbus communication environment. There are four possible functional levels that can be combined.

Communication functions

	Switch-disconnector and circuit breaker with communication Modbus
Device identification	
Address	■
Rating	-
Type of device	-
Type of control unit	-
Status indications	
ON/OFF (OF)	■
Spring charged (CH)	■
Ready to close (PF)	(1)
Fault-trip (SDE)	■
Connected/disconnected/test position (CE/CD/CT)	■
Controls	
ON/OFF (MX/XF)	■
Spring charging	-
Reset of the mechanical indicator	-

Communication Modbus

The Modbus RS 485 (RTU protocol) system is an open bus on which communicating Modbus devices (Compact NSX DC with Modbus COM, Power Meter PM700, PM800, Sepam, Vigilohm, etc.) are installed. All types of PLCs and microcomputers may be connected to the bus.

Addresses
The Modbus communication parameters (address, baud rate, parity) are entered using the RSU (Remote Setting Utility) Micrologic utility.

Modbus addresses		
@xx	Circuit breaker manager	(1 to 47)
@xx + 50	Chassis manager	(51 to 97)

The manager addresses are automatically derived from the circuit breaker address @xx entered via the Micrologic control unit (the default address is 47).

Number of devices
The maximum number of devices that may be connected to the Modbus bus depends on the type of device (Compact with Modbus COM, PM700, PM800, Sepam, Vigilohm, Compact NSX DC, etc.), the baud rate (19200 is recommended), the volume of data exchanged and the desired response time. The RS 485 physical layer offers up to 32 connection points on the bus (1 master, 31 slaves).
A fixed device requires only one connection point (communication module on the device). A drawout device uses two connection points (communication modules on the device and on the chassis).
The number must never exceed 31 fixed devices or 15 drawout devices.

Length of bus
The maximum recommended length for the Modbus bus is 1200 meters.

Bus power source
A 24 V DC power supply is required (less than 20 % ripple, insulation class II).

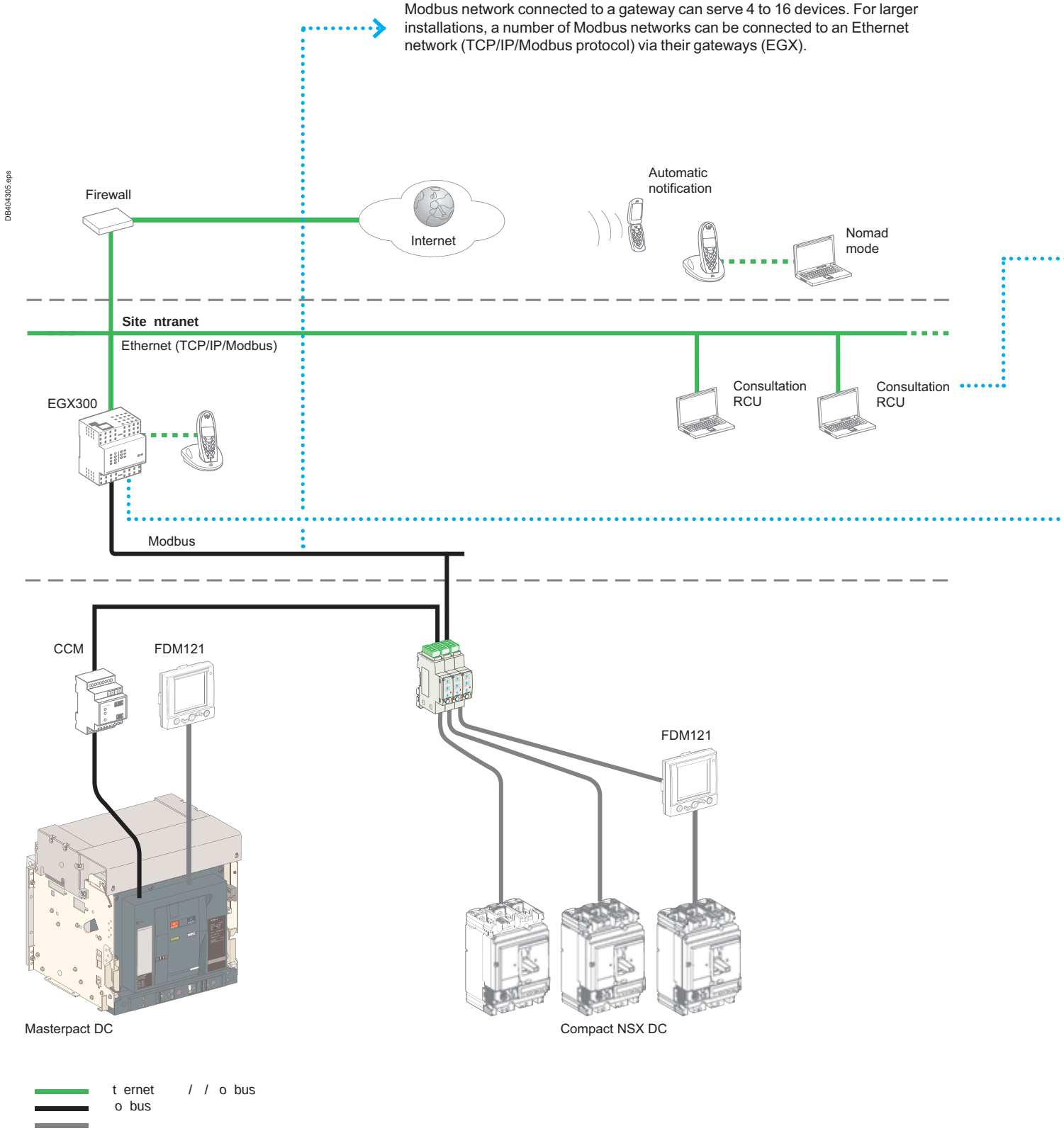
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Masterpact communication
Networks and sofware

Masterpact uses the Modbus communication protocol, compatible with ION-E electrical engineering expert system software.
Two downloadable sofware (RSU, RCU) from schneider-electric.com facilitate implementation of communication functions.

Modbus

Modbus is the most widely used communication protocol in industrial networks. It operates in master-slave mode. The devices (slaves) communicate one after the other with a gateway (master).
Masterpact DC, Compact NSX DC, PowerLogic and Sepam products all operate with this protocol. A Modbus network is generally implemented on an LV or MV switchboard scale. Depending on the data monitored and the desired refresh rate, a Modbus network connected to a gateway can serve 4 to 16 devices. For larger installations, a number of Modbus networks can be connected to an Ethernet network (TCP/IP/Modbus protocol) via their gateways (EGX).



For reference only. www.fengshengelectric.com.sg

RCU (Remote Control Utility)

PB104929.eps



RCU

Gateway

The gateway has two functions:

■ access to the company intranet (Ethernet) by converting Modbus frames to the TCP/IP/Modbus protocol

■ optional web-page server for the information from the devices.

Examples include EGX100 and EGX300.

PE86181r-251.eps



EGX 300.

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Masterpact DC communication
RCU utilities

RCU, are available to assist in starting up a communicating installation.
They can be downloaded from the Schneider Electric internet site and include a “Live update” function that enables immediate updating.Schneider Electric electrical installation supervision, management and expert system software integrates Masterpact DC, Compact DC and Compact NSX DC identification modules.

RCU (Remote Control Utility)

The RCU utility can be used to test communication for all the devices connected to the Modbus network. It is designed for use with Masterpact, Compact NSX DC, Advantys OTB and Power Meter devices. It offers a number of functions.

Mini supervisor

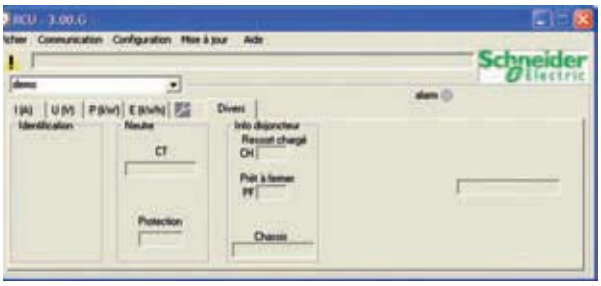
■ Display of ON/OFF status.

Open and close commands for each device

A common or individual password must first be entered.

When all functions have been tested, this utility is replaced by the supervision software selected for the installation.

PB104929_R.eps



RCU: Remote Control Utility for communication tests.

For reference only. www.fengshengelectric.com.sg

PE86181-25.eps



EGX300.

PB104859.eps



iRIO RTU.

PB104807_68.eps



ION-E.

Types of software

Masterpact and Compact NSX DC communication functions are designed to interface with software dedicated to electrical installations:

- switchboard supervision
- electrical installation supervision
- process control
- SCADA (Supervisory Control & Data Acquisition), EMS (Enterprise Management System) or BMS (Building Management System) type software.

Schneider Electric solutions

Electrical switchboard supervision via EGX300 Web servers

A simple solution for customers who want to consult the main electrical parameters of switchboard devices without dedicated software.

Up to 16 switchboard devices are connected via Modbus interfaces to an EGX300 Ethernet gateway integrating the functions of a web page server. The embedded Web pages can be easily configured with just a few mouse clicks. The information they provide is updated in real time.

The Web pages can be consulted using a standard Web browser on a PC connected via Ethernet to the company Intranet or remotely via a modem. Automatic notification of alarms and threshold overruns is possible via e-mail or SMS (Short Message Service).

Electrical installation supervision via iRIO RTU

The iRIO RTU (remote terminal unit) can be used as Ethernet coupler for the PowerLogic System devices and for any other communicating devices operating under Modbus RS485 protocol. Data is viewable via a standard web browser.

ION-E electrical engineering expert system software

ION-E is a family of web-enabled software products for high-end power-monitoring applications. It is designed for large power systems.

Other software

Masterpact, Compact NSX DC devices can forward their operating information to special software integrating the electrical installation and other technical facilities:

- SCADA process control software: Vijeo CITECT
- BMS Building Management System software: Vista.

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Panorama of electrical and mechanical accessories
Masterpact NW10 to NW40 DC

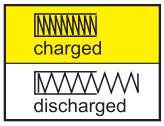
All Masterpact NW DC devices exist in circuit-breaker (equipped with Micrologic DC 1.0 control unit) and switch-disconnector versions. All auxiliaries are common from 1000 to 4000 A.

PB104736.eps



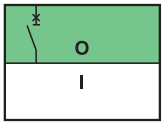
1 *OFF pushbutton.*
2 *ON pushbutton.*
3 *Closing mechanism charging handle.*
4 *Operation counter.*
5 *Operating mechanism charged and "ready to close" indication:*
- *spring charged*
- *spring discharged.*

DB104522.eps



6 *Main contact position indication:*
- *ON*
- *OFF.*

DB104523.eps



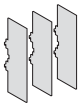
7 *Fault trip indication and reset button.*
8 *Micrologic 1.0 DC control unit.*
9 *Racking interlock.*
10 *Racking-handle storage.*
11 *Shutter position indication and locking.*
12 *"Connected / test / disconnected" position indication.*
13 *Racking-handle port.*
14 *Reset pushbutton.*
15 *Padlock locking.*
16 *Keylock locking.*

PB104432-48R.eps



Vertical rear connection.

DB101149.eps



Circuit breakers and switch-disconnectors
Masterpact NW DC exists in fixed and withdrawable versions:
- circuit breaker equipped with Micrologic 1.0 DC control unit
- switch-disconnector without the control unit.

Common auxiliaries from 1000 to 4000 A
All accessories are:
- accessible from the front in a compartment isolated from the power circuits
- secured by a single screw
- no adjustments
- adaptable on site.

Communication
Circuit-breaker or switch-disconnector integration in a supervision system requires the COM option.
Masterpact uses the Modbus communication protocol compatible with ION-E electrical engineering expert system software.
An external gateway is available for communication with other networks (Profibus, Ethernet, etc.).

Connections
- Rear vertical connection in standard.
- Possibility of conversion to horizontal connection by turning the connectors on the site by the customer (except for the NW40).
- Prefabricated series connections.
- Safety shutters, shutter locking blocks.
- Optional accessories:
  - ☐ interphase barriers
  - ☐ shutter position indication and locking.

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Locking

■ pushbutton locking by padlockable transparent cover
■ OFF-position locking by padlock or keylock
■ chassis locking:
□ in disconnected position by keylock
□ in connected, disconnected and test positions
■ door interlock (inhibits door opening with breaker in connected position)
■ racking interlock (inhibits racking with door open)
■ racking interlock between crank and OFF pushbutton
■ automatic spring discharge before breaker removal
■ mismatch protection.

PB104367A32.eps



PB104366A32.eps



Locking in disconnected position by keylock or padlock.

PB100780-32R_SE.eps



Door interlock (inhibits door opening with breaker in connected position).

Indication contacts

■ standard or low-level contacts:
□ ON/OFF indication (OF)
□ "fault-trip" indication (SDE)
□ carriage switches for connected (CE), disconnected (CD) and test (CT) positions.

PB100806-19R.eps



OF contact (microswitch).

PB100807-12R.eps



OF contact (rotary).

PB100820-19R.eps



SDE contact.

PB100816-19R.eps



Combined contact (connected/closed).

Remote operation

■ remote ON/OFF:
□ gear motor
□ XF closing or MX opening voltage releases
□ PF ready-to-close contact
□ options:
- RAR automatic or Res electrical remote reset
- BPFE electrical closing pushbutton
■ remote tripping function:
□ MN voltage release:
- standard
- adjustable or non-adjustable delay
□ or 2nd MX voltage release.

PB104349A55.eps



Remote ON/OFF.

PB100808-22R.eps



Gear motor.

PB100809-11R.eps



Voltage releases (MX and XF).

PB100818-11R.eps



PF ready-to-close contact.

Accessories

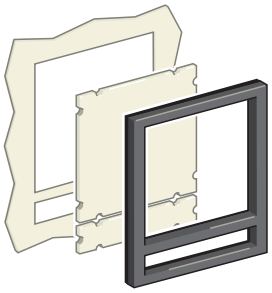
■ auxiliary terminal shield
■ operation counter
■ escutcheon
■ transparent cover for escutcheon
■ escutcheon blanking plate.

PB104382-27R.eps



Operation counter.

DB104524.eps



Escutcheon with blanking plate.

PB100776-29R.eps



Transparent cover.

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Connection
Overview of solutions

Two types of connection are available: vertical connection is standard however the connectors can be rotated for on-site conversion to horizontal connection (except for NW40).

Rear connection fixed device

Masterpact DC

Vertical rear connection

PB105026.eps



Horizontal rear connection

PB105025.eps



For reference only. www.fengshengelectric.com.sg

Rear connection withdrawable device

Masterpact DC

Horizontal rear connection

DB402291_59.eps



DB402303_59.eps



Masterpact DC

Vertical rear connection

PB104920_59.eps



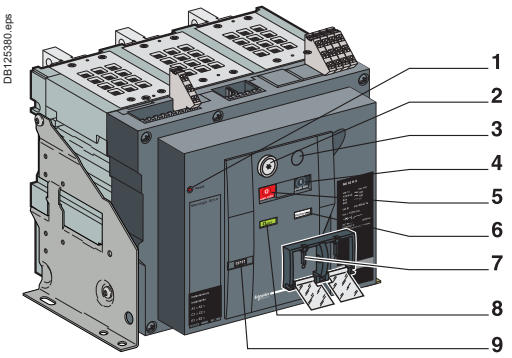
DB402323_59.eps



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Electrical and mechanical accessories
Masterpact NW10 to NW40 DC

Locking on the device



1 *Fault trip indication and reset button.*
2 *OFF position locking.*
3 *Electrical closing pushbutton.*
4 *ON pushbutton.*
5 *OFF pushbuton.*
6 *Operating mechanism charged and "ready to close" indication.*
7 *Pushbutton locking.*
8 *Main contact position indication.*
9 *Operation counter.*



Access to pushbuttons protected by transparent cover.

Pushbutton locking VBP

The transparent cover blocks access to the pushbuttons used to open and close the device.
It is possible to independently lock the opening button and the closing button. The locking device is often combined with a remote operating mechanism.
The pushbuttons may be locked using either:
- three padlocks (not supplied)
- lead seal
- two screws.



Pushbutton locking using a padlock.

Device locking in the OFF position
VCPO - by padlocks - VSPO - by keylocks

The circuit breaker is locked in the OFF position by physically maintaining the opening pushbutton pressed down:
- using padlocks (one to three padlocks, not supplied)
- using keylocks (one or two different keylocks, supplied).

Keys may be removed only when locking is effective (Profalux or Ronis type locks).
The keylocks are available in any of the following configurations:
- one keylock
- one keylock mounted on the device + one identical keylock supplied separately for interlocking with another device
- two different key locks for double locking.

Profalux and Ronis keylocks are compatible with each other.
A locking kit (without locks) is available for installation of one or two keylocks (Ronis, Profalux, Kirk or Castell).

Accessory-compatibility
3 padlocks and/or 2 keylocks.



OFF position locking using a padlock.

Cable-type door interlock IPA

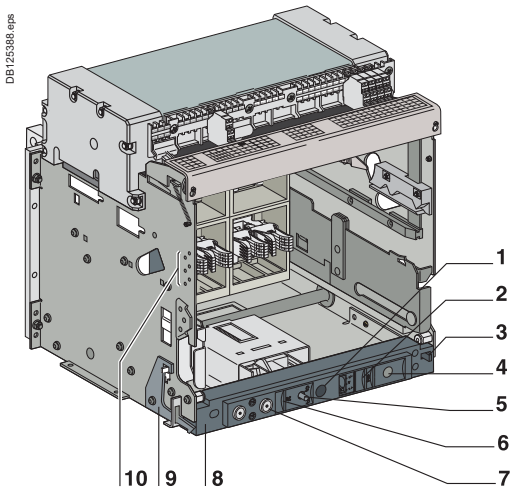
This option prevents door opening when the circuit breaker is closed and prevents circuit breaker closing when the door is open.
For this, a special plate associated with a lock and a cable is mounted on the right side of the circuit breaker.
With this interlock installed, the source changeover function cannot be implemented.



OFF position locking using a keylock.

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Locking on the chassis



1 *Racking-handle port.*
2 *"Connected/test/ disconnected" position indication.*
3 *Racking interlock.*
4 *Racking-handle storage.*
5 *Reset pushbutton.*
6 *Padlock locking.*
7 *Keylock locking.*
8 *Chassis front plate (accessible with cubicle door closed).*
9 *"Disconnected" position door interlock.*
10 *Mismatch protection.*

"Disconnected" position locking
By padlocks (standard) or keylocks (VSPD option)

Mounted on the chassis and accessible with the door closed, these devices lock the circuit breaker in the "disconnected" position in two manners:
- using padlocks (standard), up to three padlocks (not supplied)
- using keylocks (optional), one or two different keylocks are available.

Profalux and Ronis keylocks are available in different options:
- one keylock
- two different keylocks for double locking
- one (or two) keylocks mounted on the chassis + one (or two) identical keylocks supplied separately for interlocking with another device.

A locking kit (without locks) is available for installation of one or two keylocks (Ronis, Profalux, Kirk or Castell).

"Connected", "disconnected" and "test" position locking

The "connected", "disconnected" and "test" positions are shown by an indicator and are mechanically indexed. The exact position is obtained when the racking handle blocks. A release button is used to free it.
As standard, the circuit breaker can be locked only in "disconnected" position. On request, the locking system may be modified to lock the circuit breaker in any of the three positions "connected", "disconnected" or "test".

Door interlock catch VPEC

Mounted on the right or left-hand side of the chassis, this device inhibits opening of the cubicle door when the circuit breaker is in "connected" or "test" position. It the breaker is put in the "connected" position with the door open, the door may be closed without having to disconnect the circuit breaker.



Racking interlock.

Racking interlock VPOC

This device prevents insertion of the racking handle when the cubicle door is open.

Cable-type door interlock IPA

This option is identical for fixed and drawout versions.

Racking interlock between crank and OFF pushbutton IBPO for NW DC

This option makes it necessary to press the OFF pushbutton in order to insert the racking handle and holds the device open until the handle is removed.



Mismatch protection.

Automatic spring discharge before breaker removal DAE for NW DC

This option discharges the springs before the breaker is removed from the chassis.

Mismatch protection VDC

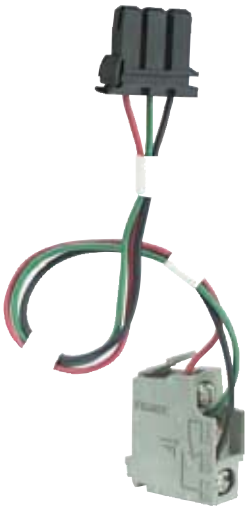
Mismatch protection ensures that a circuit breaker is installed only in a chassis with compatible characteristics. It is made up of two parts (one on the chassis and one on the circuit breaker) offering twenty different combinations that the user may select.

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Electrical and mechanical accessories
Masterpact NW10 to NW40 DC

Indication contacts are available:
- in the standard version for relay applications
- in a low-level version for control of PLCs and electronic circuits.

PB100806-32R.eps



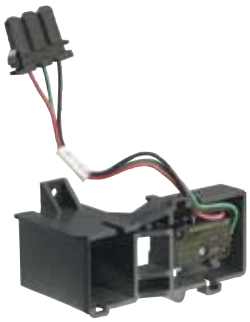
ON/OFF indication contacts OF (microswitch type).

PB100807-20R.eps



ON/OFF indication contacts OF (rotary type).

PB100820-32R.eps



Additional "fault-trip" indication contacts SDE.

PB100816-32R.eps



Combined contacts.

Indication contacts

ON/OFF indication contacts OF

Rotary type changeover contacts directly driven by the mechanism. These contacts trip when the minimum isolation distance between the main circuit-breaker contacts is reached.

OF				
Supplied as standard				4
Maximum number				12
Breaking capacity (A) p.f.: 0.3 AC12/DC12	Standard			minimum load: 100 mA/24 V
		V AC	240/380	10/6 (1)
			480	10/6 (1)
			690	6
		V DC	24/48	10/6 (1)
			125	10/6 (1)
			250	3
	Low-level			minimum load: 2 mA/15 V
		V AC	24/48	6
			240	6
			380	3
		V DC	24/48	6
			125	6
			250	3

(1) Standard contacts: 10 A; optional contacts: 6 A.

"Fault-trip" indication contacts SDE

Circuit-breaker tripping due to a fault is signalled by:
- a red mechanical fault indicator (reset)
- one changeover contact SDE.

Following tripping, the mechanical indicator must be reset before the circuit breaker may be closed. One SDE is supplied as standard. An optimal SDE may be added. This latter is incompatible with the electrical reset after fault-trip option (Res).

SDE				
Supplied as standard				1
Maximum number				2
Breaking capacity (A) p.f.: 0.3 AC12/DC12	Standard			minimum load: 100 mA/24 V
		V AC	240/380	5
			480	5
			690	3
		V DC	24/48	3
			125	0.3
			250	0.15
	Low-level			minimum load: 2 mA/15 V
		V AC	24/48	3
			240	3
			380	3
		V DC	24/48	3
			125	0.3
			250	0.15

Combined "connected/closed" contacts EF

The contact combines the "device connected" and the "device closed" information to produce the "circuit closed" information. Supplied as an option for Masterpact NW DC, it is mounted in place of the connector of an additional OF contact.

EF				
Maximum number				8
Breaking capacity (A) p.f.: 0.3 AC12/DC12	Standard			minimum load: 100 mA/24 V
		V AC	240/380	6
			480	6
			690	6
		V DC	24/48	2.5
			125	0.8
			250	0.3
	Low-level			minimum load: 2 mA/15 V
		V AC	24/48	5
			240	5
			380	5
		V DC	24/48	2.5
			125	0.8
			250	0.3

For reference only. www.fengshengelectric.com.sg

PB100817-32R.eps



CE, CD and CT "connected/disconnected/test" position carriage switches.

"Connected", "disconnected" and "test" position carriage switches

Three series of optional auxiliary contacts are available for the chassis:

- changeover contacts to indicate the "connected" position CE
- changeover contacts to indicate the "disconnected" position CD. This position is indicated when the required clearance for isolation of the power and auxiliary circuits is reached.
- changeover contacts to indicate the "test" position CT. In this position, the power circuits are disconnected and the auxiliary circuits are connected.

Additional actuators

A set of additional actuators may be installed on the chassis to change the functions of the carriage switches.

Contacts				CE	CD	CT
Maximum number	Standard with additional actuators			3 9 6 6 3	3 0 3 0 6	3 0 0 3 0
Breaking capacity (A) p.f.: 0.3 AC12/DC12	Standard			minimum load: 100 mA/24 V		
		V AC	240	8		
			380	8		
			480	8		
			690	6		
		V DC	24/48	2.5		
			125	0.8		
			250	0.3		
	Low-level			minimum load: 2 mA/15 V		
		V AC	24/48	5		
			240	5		
			380	5		
		V DC	24/48	2.5		
			125	0.8		
			250	0.3		

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Electrical and mechanical accessories
Masterpact NW10 to NW40 DC

Two solutions are available for remote operation of Masterpact devices:
- a point-to-point solution
- a bus solution with the COM communication option.

PB104349A-68R.eps



Remote operation: remote ON / OFF

The remote ON / OFF function is used to remotely open and close the circuit breaker.
It is made up of:
- an electric motor MCH equipped with a “springs charged” limit switch contact CH
- two voltage releases:
  - a closing release XF
  - an opening release MX.

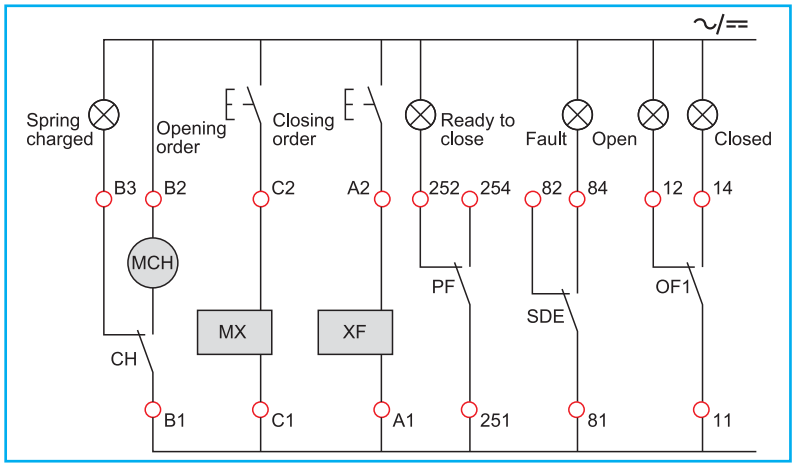
Optionally, other functions may be added:
- a “ready to close” contact PF
- an electrical closing pushbutton BPFE
- remote RES following a fault.

A remote-operation function is generally combined with:
- device ON / OFF indication OF
- “fault-trip” indication SDE.

Note
An opening order always takes priority over a closing order. If opening and closing orders occur simultaneously, the mechanism discharges without any movement of the main contacts. The circuit breaker remains in the open position (OFF).
In the event of maintained opening and closing orders, the standard mechanism provides an anti-pumping function by blocking the main contacts in open position.
Anti-pumping function. After fault tripping or intentional opening using the manual or electrical controls, the closing order must first be discontinued, then reactivated to close the circuit breaker.
When the automatic reset after fault trip (RAR) option is installed, to avoid pumping following a fault trip, the automatic control system must take into account the information supplied by the circuit breaker before issuing a new closing order or blocking the circuit breaker in the open position. (information on type of fault: overload, short time delay, earth-leakage fault, fault vigi or short-circuit, etc.)

Wiring diagram of a point-to-point remote ON / OFF function

DB402619.eps

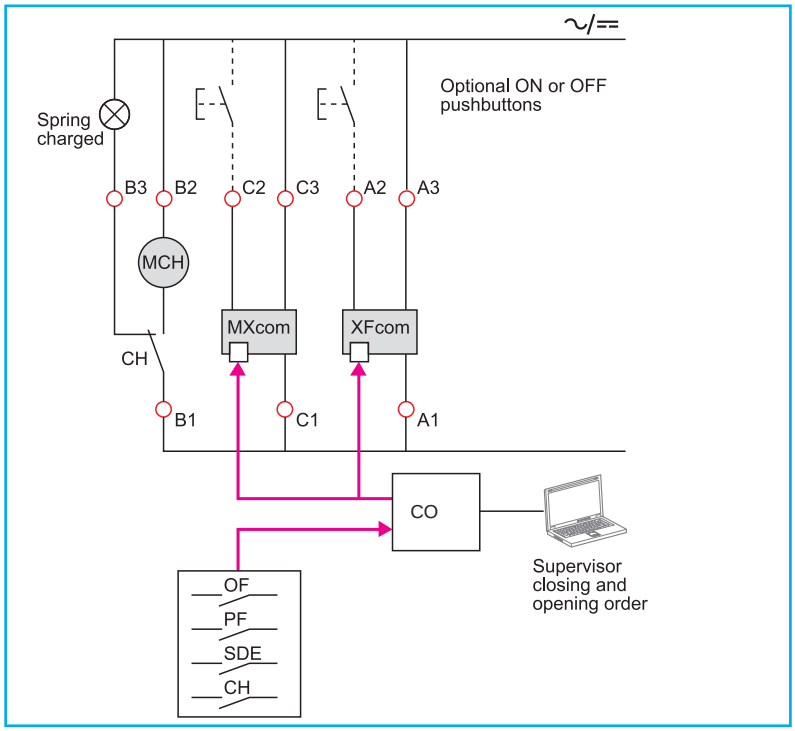


Note
MX communicating releases are of the impulse type only and cannot be used to lock a circuit breaker in OFF position. For locking in OFF position, use the remote tripping function (2nd MX or MN).

When Mx or XF communicating releases are used, the third wire (C3, A3) must be connected even if the communication module is not installed. When the control voltage (C3-C1 or A3-A1) is applied to the MX or XF releases, it is necessary to wait 1.5 seconds before issuing an order. consequently, it is advised to use standrad MX or XF releases for applications such as source-changeover systems.

Wiring diagram of a bus-type remote ON / OFF function

DB402620.eps



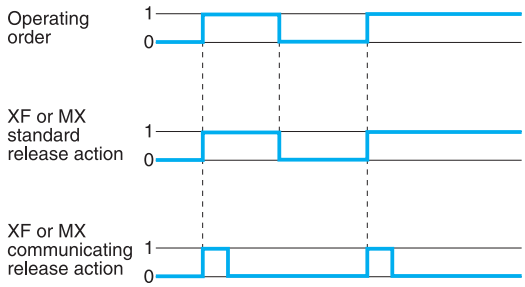
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PB100808-32R.eps



Electric motor MCH for Masterpact NW DC.

DB402621.eps



PB100809-16R.eps



XF and MX voltage releases.

PB100818-16R.eps



"Ready to close" contacts PF.

Electric motor MCH

The electric motor automatically charges and recharges the spring mechanism when the circuit breaker is closed. Instantaneous reclosing of the breaker is thus possible following opening. The spring-mechanism charging handle is used only as a backup if auxiliary power is absent.
The electric motor (MCH) is equipped as standard with a limit switch contact (CH) that signals the "charged" position of the mechanism (springs charged).

Characteristics		
Power supply	V AC 50/60 Hz	48/60 - 100/130 - 200/240 - 277 - 380/415 - 400/440 - 480
	V DC	24/30 - 48/60 - 100/125 - 200/250
Operating threshold		0.85 to 1.1 Un
Consumption (VA or W)		180
Motor overcurrent		2 to 3 In for 0.1 s
Charging time		maximum 4 seconds
Operating frequency		maximum 3 cycles per minute
CH contact		10 A at 240 V

Voltage releases XF and MX

Their supply can be maintained or automatically disconnected.

Closing release XF

The XF release remotely closes the circuit breaker if the spring mechanism is charged.

Opening release MX

The MX release instantaneously opens the circuit breaker when energised. It locks the circuit breaker in OFF position if the order is maintained (except for MX "communicating" releases).

Note: *whether the operating order is maintained or automatically disconnected (pulse-type), XF or MX "communicating" releases ("bus" solution with "COM" communication option) always have an impulse-type action.*

Characteristics		XF	MX
Power supply	V AC 50/60 Hz	24 - 48 - 100/130 - 200/250 - 277 - 380/480	
	V DC	12 - 24/30 - 48/60 - 100/130 - 200/250	
Operating threshold		0.85 to 1.1 Un	0.7 to 1.1 Un
Consumption (VA or W)		pick-up: 200 (during 200 ms) hold: 4.5	pick-up: 200 (during 200 ms) hold: 4.5
Circuit-breaker response time at Un		70 ms ±10 (NW DC ⩽ 4000 A) 80 ms ±10 (NW DC > 4000 A)	50 ms ±10 (NW DC)

"Ready to close" contact PF

The "ready to close" position of the circuit breaker is indicated by a mechanical indicator and a PF changeover contact. This signal indicates that all the following are valid:

- ■ the circuit breaker is in the OFF position
- ■ the spring mechanism is charged
- ■ a maintained opening order is not present:
- □ MX energised
- □ fault trip
- □ remote tripping second MX or MN
- □ device not completely racked in
- □ device locked in OFF position
- □ device interlocked with a second device.

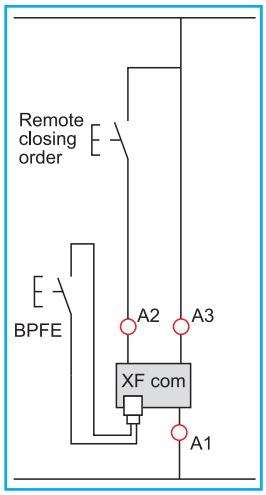
Characteristics				
Supplied as standard				-
Maximum number				1
Breaking capacity p.f.: 0.3 AC12/DC12	Standard			minimum load: 100 mA/24 V
		V AC	240/380	5
			480	5
			690	3
		V DC	24/48	3
			125	0.3
			250	0.15
	Low-level			minimum load: 2 mA/15 V
		V AC	24/48	3
			240	3
			380	3
		V DC	24/48	3
			125	0.3
			250	0.15

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Electrical and mechanical accessories
Masterpact NW10 to NW40 DC

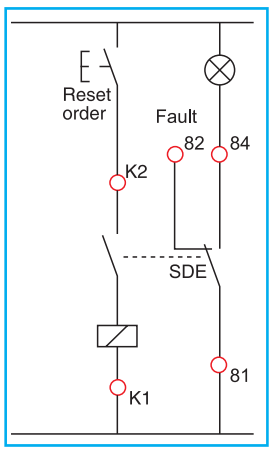
Electrical closing pushbutton BPFE
Located on the front panel, this pushbutton carries out electrical closing of the circuit breaker. It is generally associated with the transparent cover that protects access to the closing pushbutton.
Electrical closing via the BPFE pushbutton takes into account all the safety functions that are part of the control/monitoring system of the installation.
The BPFE connects to the closing release XF in place of the COM module.
The COM module is incompatible with this option.
Different types of voltage exist and the XF electromagnet is compulsary if the BPFE option is selected.

DB402622.eps



Remote reset after fault trip
Electrical reset after fault trip RES
Following tripping, this function resets the “fault trip” indication contacts SDE and the mechanical indicator and enables circuit breaker closing.
Power supply: 110 / 130 V AC and 200 / 240 V AC.
The use of XF closing release is compulsory with this option.

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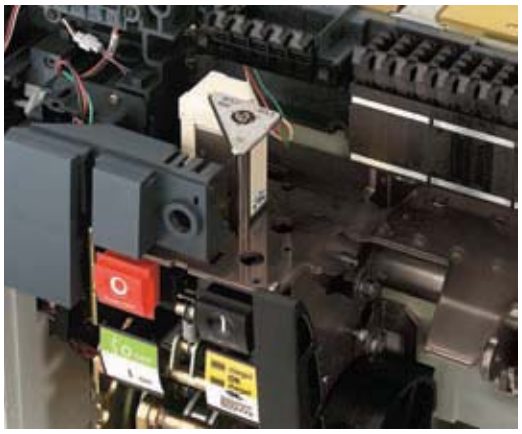


Automatic reset after fault trip RAR
Following tripping, a reset of the mechanical indicator (reset button) is no longer required to enable circuit-breaker closing. The mechanical (reset button) and electrical SDE indications remain in fault position until the reset button is pressed.
The use of XF closing release is compulsory with this option.

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Remote operation: remote tripping

PB104369A-68R.eps

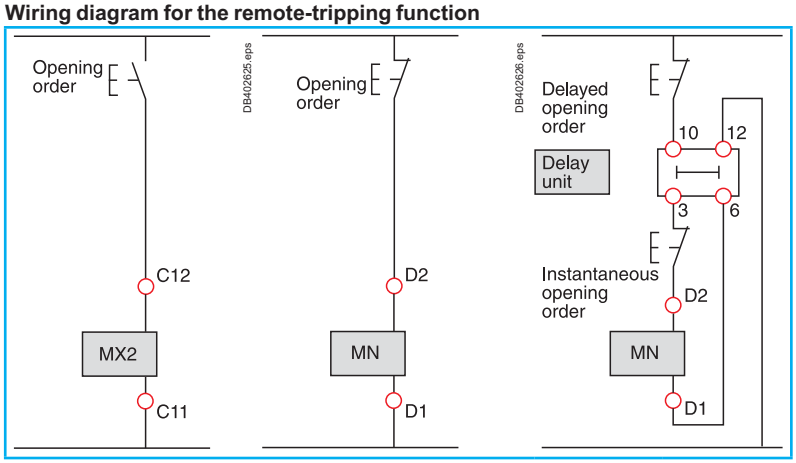


This function opens the circuit breaker via an electrical order. It is made up of:
- a shunt release second MX
- or an undervoltage release MN
- or a delayed undervoltage release MNR: (MN + delay unit).

These releases (2nd MX or MN) cannot be operated by the communication bus. The delay unit, installed outside the circuit breaker, may be disabled by an emergency OFF button to obtain instantaneous opening of the circuit breaker.

Wiring diagram for the remote-tripping function

DB402624.eps



PB100809-16R.eps



MX or MN voltage release.

Voltage releases second MX

When energised, the MX voltage release instantaneously opens the circuit breaker. A continuous supply of power to the second MX locks the circuit breaker in the OFF position.

Characteristics			
Power supply	V AC 50/60 Hz	24 - 48 - 100/130 - 200/250 - 277 - 380/480	
	V DC	24/30 - 48/60 - 100/130 - 200/250	
Operating threshold		0.7 to 1.1 Un	
Permanent locking function		0.85 to 1.1 Un	
Consumption (VA or W)		pick-up: 200 (during 80 ms)	hold: 4.5
Circuit-breaker response time at Un		50 ms ±10	

Instantaneous voltage releases MN

The MN release instantaneously opens the circuit breaker when its supply voltage drops to a value between 35 % and 70 % of its rated voltage. If there is no supply on the release, it is impossible to close the circuit breaker, either manually or electrically. Any attempt to close the circuit breaker has no effect on the main contacts. Circuit-breaker closing is enabled again when the supply voltage of the release returns to 85 % of its rated value.

Characteristics			
Power supply	V AC 50/60 Hz	24 - 48 - 100/130 - 200/250 - 380/480	
	V DC	12 - 24/30 - 48/60 - 100/130 - 200/250	
Operating threshold	opening	0.35 to 0.7 Un	
	closing	0.85 Un	
Consumption (VA or W)		pick-up: 200 (during 200 ms)	hold: 4.5
MN consumption with delay unit		pick-up: 200 (during 200 ms)	hold: 4.5
Circuit-breaker response time at Un		90 ms ±5	

MN delay units

To eliminate circuit-breaker nuisance tripping during short voltage dips, operation of the MN release can be delayed. This function is achieved by adding an external delay unit in the MN voltage-release circuit. Two versions are available, adjustable and non-adjustable.

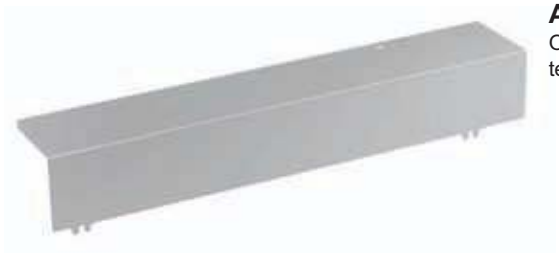
Characteristics			
Power supply	non-adjustable	100/130 - 200/250	
VAC 50-60 Hz/DC	adjustable	48/60 - 100/130 - 200/250 - 380/480	
Operating threshold	opening	0.35 to 0.7 Un	
	closing	0.85 Un	
Consumption of delay unit alone (VA or W)		pick-up: 200 (during 200 ms)	hold: 4.5
Circuit-breaker response time at Un	non-adjustable	0.25 s	
	adjustable	0.5 s - 0.9 s - 1.5 s - 3 s	

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Electrical and mechanical accessories
Masterpact NW10 to NW40 DC

Shields, blanking plates, counters

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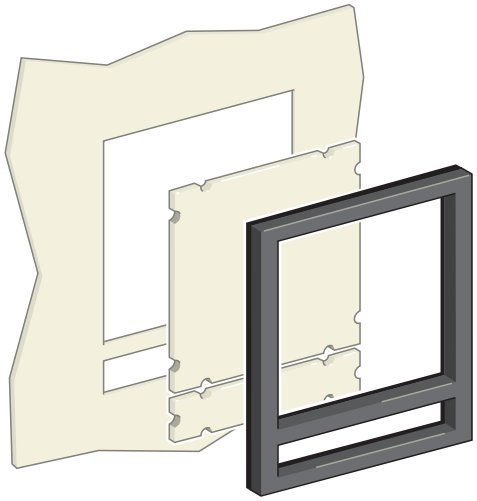
Auxiliary terminal shield CB
Optional equipment mounted on the chassis, the shield prevents access to the terminal block of the electrical auxiliaries.

PB104382-32R.eps



Operation counter CDM
The operation counter sums the number of operating cycles and is visible on the front panel. It is compatible with manual and electrical control functions.

DB101173.eps



Escutcheon CDP
Optional equipment mounted on the door of the cubicle, the escutcheon increases the degree of protection to IP 40 (circuit breaker installed free standing: IP30) .
It is available in fixed and drawout versions.

Blanking plate OP for escutcheon
Used with the escutcheon, this option closes off the door cut-out of a cubicle not yet equipped with a device. It may be used with the escutcheon for both fixed and drawout devices.

Transparent cover CCP for escutcheon
Optional equipment mounted on the escutcheon, the cover is hinged and secured by a screw. It increases the degree of protection to IP 54, IK10. It adapts to drawout devices.

Escutcheon CDP with blanking plate.

PB100776-42R.eps

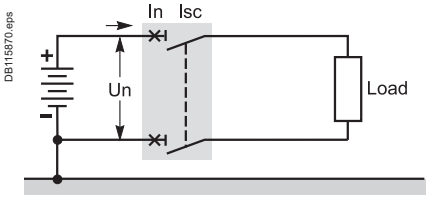


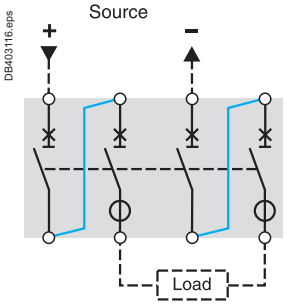
Transparent cover CCP for escutcheon.

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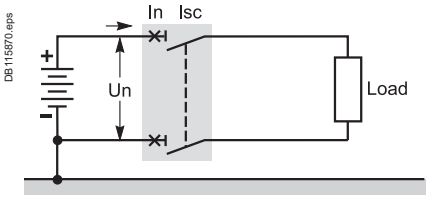
Selection guide for DC circuit breakers

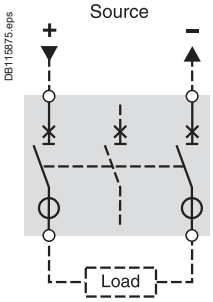
Examples of circuit-breaker selection





Masterpact NW20H DC version E.





Masterpact NW10N DC version C.

Selection of a Masterpact NW DC

Example 1

- type of system - isolated polarities
- system voltage - Un = 750 V DC with time constant L/R = 30 ms
- rated current required at point of installation In = 2000 A
- short-circuit current at the point of installation Isc = 40 kA

Selection constraints - (see page A-30)
The system with isolated polarities requires (see conclusion page A-30):
- identical protection for each polarity
- an equal number of poles for each polarity, i.e. a total of two or four
- all poles of each polarity must have breaking capacity ⩾ Isc max. at Un, i.e. 40 kA/750 V in this case.

Selection possibilities - (see page A-31)
The table for series poles indicates for a voltage 24 V < Un ⩽ 750 V and the type of system, use of a four-pole, version E circuit breaker.

Circuit-breaker selection - (see page A-36)
The Masterpact NW DC characteristics table indicates more specifically with a 2000 A a NW20 DC type H circuit breaker with a breaking capacity of 50 kA/750 V (L/R = 30 ms).
The correct selection is a Masterpact NW20 DC type H version E, 2000 A, 50 kA, available in fixed and drawout versions.

Example 2

- type of system - one polarity earthed
- system voltage - Un = 500 V DC with time constant L/R = 15 ms
- rated current required at point of installation In = 1000 A
- short-circuit current at the point of installation Isc = 30 kA

Selection constraints - (see page A-30)
The system with one polarity connected to earth requires (see conclusion page A-30):
- protection poles on the protected polarity
- all poles contribute to breaking for the polarity:
  - 1, 2 or 3P without disconnection of the two polarities
  - 2, 3 or 4P with disconnection of the two polarities
- all poles of the protected polarity must have breaking capacity ⩾ Isc max. at Un, i.e. 30 kA/500 V in this case.

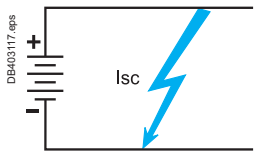
Selection possibilities - (see page A-31)
The table for series poles indicates for a voltage 24 V < Un ⩽ 500 V and the type of system, use of a three-pole, version C circuit breaker.

Circuit-breaker selection - (see page A-36)
The Masterpact NW DC characteristics table indicates more specifically with a 1000 A a NW10 DC type N circuit breaker with a breaking capacity of 35 kA/500 V (L/R = 15 ms). The correct selection is a Masterpact NW10 DC type N version C, 1000 A, 35 kA, available in fixed and drawout versions.

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Calculation of DC distribution-system characteristics

Short-circuit currents L/R time constant



Short-circuit currents

Calculation of the short-circuit current across the terminals of a battery

During a short-circuit, the battery discharges a current equal to

$$Isc = \frac{Vb}{Ri}$$

- Vb = maximum discharge voltage (battery 100 % charged)
- Ri = internal resistance equivalent to all cells (a function of the capacity in ampere-hours).

Example

- consider a set of four 500 Ah batteries connected in parallel
- discharge voltage of one battery: 240 V (110 cells 2.2 V each)
- discharge current of one battery: 300 A with a run-time of 30 minutes
- discharge current of all four batteries: 1200 A with a run-time of 30 minutes
- internal resistance 0.5 mΩ per cell, i.e. for one battery:

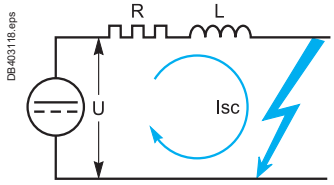
$Ri = 110 \times 0.5 \times 10^{-3} = 55 \times 10^{-3}\ \Omega$

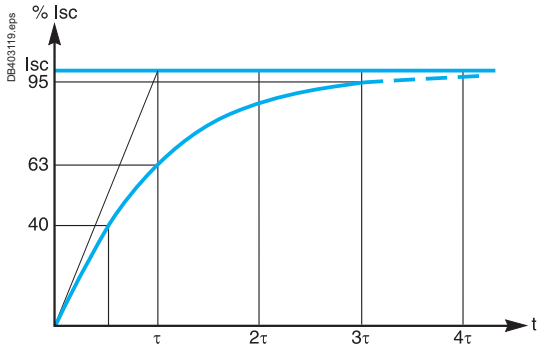
- short-circuit current of one battery: $Isc = 240\ V / 55 \times 10^{-3}\ \Omega = 4.37\ kA$
- neglecting the resistance of the connections, for all four batteries discharging the short-circuit current in parallel, the total short-circuit current is four times that of one battery, i.e. Isc = 4 x 4.37 kA = 17.5 kA.

Note: *if the internal resistance is not known, it is possible to use the following rough approximation: Isc = kc where c is the capacity of the battery in ampere-hours and k is a coefficient close to 10 and always less than 20.*

Other typical examples

- PABXs: Isc from 5 to 25 kA at 240 V DC with L/R = 5 ms
- submarine: Isc from 40 to 60 kA at 400 V DC with L/R = 5 ms.





L/R time constant

When a short-circuit occurs across the terminals of a DC circuit, the current rises from the load current (≤ In) to the short-circuit current Isc over a period of time that depends on the value of the resistance R and inductance L of the short-circuited loop.
The equation determining the current in the loop is:

$u = Ri + L\ di/dt$

The curve of I versus time is defined (neglecting In) by the equation:

$i = Isc\ (1 - \exp(t/\tau))$

where $\tau = L/R$ is the time constant for the rise to Isc.
Practically speaking, after a time $t = 3\tau$, the short-circuit is considered to be established, because the value of exp(-3) = 0.05 is negligible compared to 1 (see the curve opposite).
The lower the time constant (e.g. battery circuit), the shorter the time required for the current to rise to Isc.

To express breaking capacity, the interrupted short-circuit current with the following time constants is used:

- L/R = 5 ms, fast short-circuit
- L/R = 15 ms, standardised value used in standard IEC 60947-2
- L/R = 30 ms, slow short-circuit.

In general, the value of the system time constant is calculated under worst-case conditions, across the terminals of the generator.

Breaking-capacity values for:

- Compact NSX DC (table page A-5) are the same for 5 ms and 15 ms
- Masterpact NW DC (table page A-37) are indicated for 3 values, 5 ms, 15 ms and 30 ms.

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Installation recommendations

Presentation *2*
Functions and characteristics *A-1*

Compact NSX100 to NSX630 DC

Installation in switchboards B-2
Power connections B-3
Safety clearances and minimum distances B-5
Temperature derating B-6
Characteristics of circuit breakers with parallel connection of poles B-7

Masterpact NW10 to NW40 DC

Installation in switchboard B-8
Door interlock B-9
Cable-type door interlock - Connection of MN, MX and XF voltage releases B-10
Power connection B-11
Busbar sizing B-14
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Dimensions and connection *C-1*
Electrical diagrams *D-1*
Additional characteristics *E-1*
Catalogue numbers and order form *F-1*

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Compact NSX100 to NSX630 DC
Installation in switchboards

Possible mounting positions
For fixed or withdrawable circuit breakers

Fig. A

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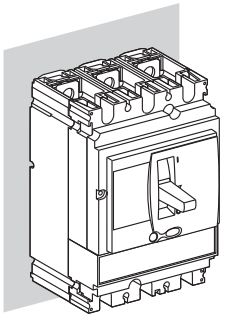


Fig. B

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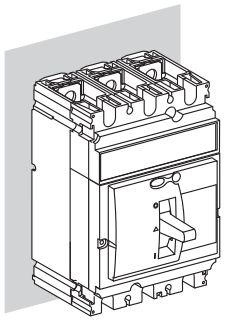


Fig. C

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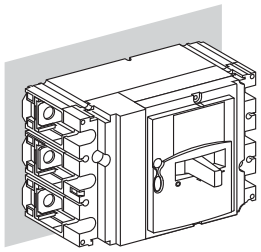


Fig. D

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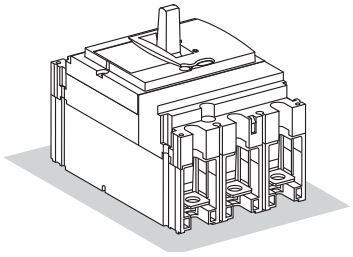
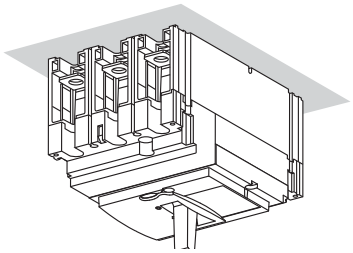


Fig. E

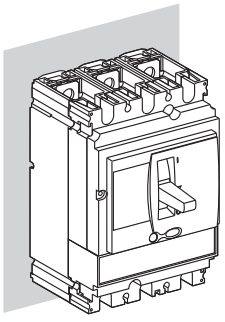
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Possible supports
For fixed or withdrawable circuit breakers

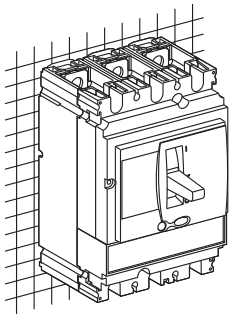
On a plain mounting plate

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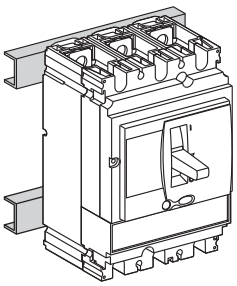
On a slotted mounting plate

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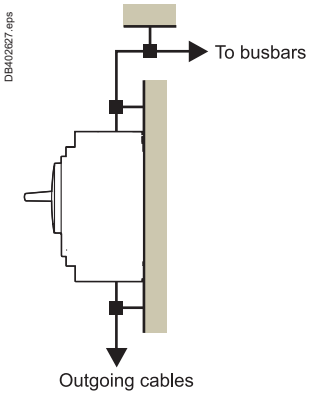


On rails

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Electrodynamic forces on the conductors

The circuit breakers can be connected with copper, tinned copper or tinned aluminum conductors (rigid or flexible bars, cables).
In the event of a short-circuit, electrodynamic forces will be exerted on the conductors.
They must therefore be correctly sized and maintained in place using supports.
Electrical connection points on all types of devices (contactors, circuit breakers, etc.) should not be used for mechanical support.

Ties for flexible bars and cables

The table below indicates the maximum distance between ties depending on the prospective short-circuit current.
The maximum distance between ties attached to the switchboard frame is 400 mm.

Type of tie	Maximum distance between ties (mm)	Short-circuit current (kA rms)
"PANDUIT" type ties Width: 4.5 mm Max. load: 22 kg White	200	10
	100	14
	50	19
"SAREL" type ties Width: 9 mm Max. load: 90 kg Black Double ties	350	21
	200	27
	100	36
	70	45
	50	100

Note: *for 50 mm² cables, use the 9 mm wide ties.*

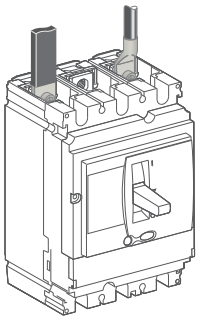
Weights

Type		Circuit breaker	Plug-in base	Chassis	Motor mechanism
NSX100N/H DC	1P/1D	0.5	-	-	-
	2P/2D	1.45	-	-	-
NSX100 DC	3P/3D	1.79	0.8	2.2	1.2
	4P/4D	2.57	1.05	2.2	1.2
NSX160N/H DC	1P/1D	0.5	-	-	-
	2P/2D	1.45	-	-	-
NSX160N / DC	3P/3D	1.85	0.8	2.2	1.2
	4P/4D	2.58	1.05	2.2	1.2
NSX250 DC	3P/3D	2.2	0.8	2.2	1.2
	4P/4D	2.78	1.05	2.2	1.2
NSX400/630 DC	3P/3D	6.19	2.4	2.2	2.8
	4P/4D	8.13	2.8	2.2	2.8

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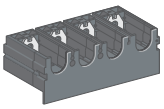
Compact NSX100 to NSX630 DC
Power connections

DB112168.eps



Connection of insulated bars or cables with lugs

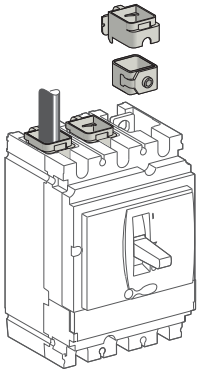
DB115655.eps



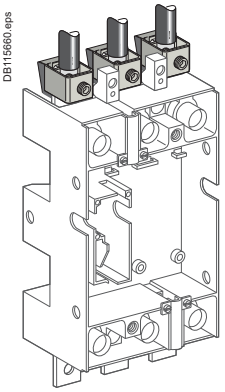
		NSX100 DC	NSX160/250 DC	NSX400/630 DC
Bars	L (mm)	≤ 25	≤ 25	≤ 32
	l (mm)	d + 10	d + 10	d + 15
	d (mm)	≤ 10	≤ 10	≤ 15
	e (mm)	≤ 6	≤ 6	3 ≤ e ≤ 10
	Ø (mm)	6.5	8.5	10.5
Lugs	L (mm)	≤ 25	≤ 25	≤ 32
	Ø (mm)	6.5	8.5	10.5
Tightening torque (Nm) (1)		10	15	50
Tightening torque (Nm) (2)		5	5	20

(1) Tightening torque for lugs or bars on the circuit breaker.
(2) Tightening torque for rear connections or terminal extensions on plug-in base.

DB115659.eps



DB115660.eps



Connection of bare cables

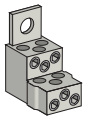
NSX100 to 250 DC

DB112315.eps



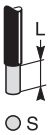
Cable connector.

DB111327.eps



Distribution connector.

DB104660.eps



	Cable connector	Steel ≤ 160 A	Aluminium ≤ 250 A		
L (mm)		20	20		
S (mm²) Cu/Al		1.5... 95 (1)	10... 16	25... 35	50...185 150 max. flexible
Tightening torque (Nm)		12	15	20	26
6-cable distribution connector (copper or aluminium)					
L (mm)		15 or 30			
S (mm²) Cu/Al		1.5... 6 (1)	8... 35		
Tightening torque (Nm)		4	6		

(1) For flexible cables from 1.5 to 4 mm², connection with crimped or self-crimping ferrule.

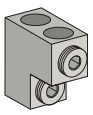
NSX400 to 630 DC

DB112316.eps



Cable connector.

DB111326.eps



Distribution connector.

DB104660.eps



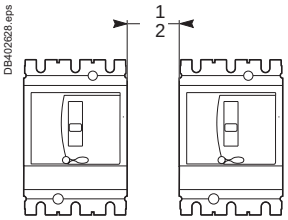
	Cable connector	2-cable connector
L (mm)	20	30 or 60
S (mm²) Cu/Al	35 to 300 rigid 240 max. flexible	2 x 85 to 2 x 240 rigid 240 max. flexible
Tightening torque (Nm)	31	31

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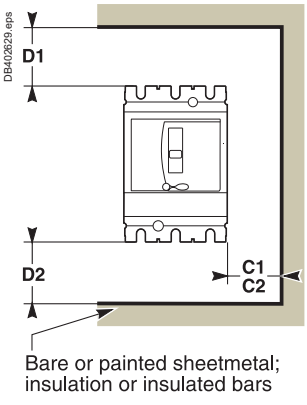
When installing a Compact NSX100 to NSX630 Direct Current circuit breaker, minimum distances (safety clearances) must be maintained between the device and panels, bars and other protection devices installed nearby. These distances, which depend on the ultimate breaking capacity, are defined by tests carried out in accordance with standard IEC 60947-2.
If installation conformity is not checked by type tests, it is also necessary to:
- use insulated bars for circuit-breaker connections
- block off the busbars using insulating screens.

Terminal shields, interphase barriers and the insulation kit are recommended and may be mandatory depending on the utilisation voltage and the type of installation (fixed, withdrawable).

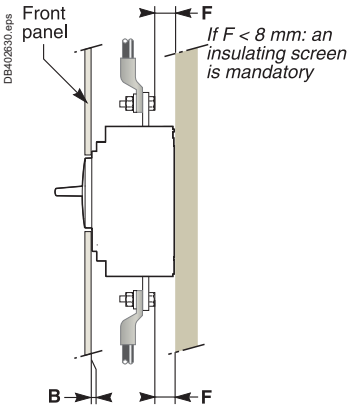
Minimal distance between two adjacent circuit breakers



Minimal distance between the circuit breaker and top, bottom or side panels



Minimal distance between the circuit breaker and front or rear panels



Dimensions (mm)		Insulation, insulated bars or painted sheet metal			Bare sheetmetal					
Compact circuit breaker		C1	D1	D2	C2	D1	D2	A1 (2)	A2 (3)	B
NSX100-250 DC	U ⩽ 250 V	0	30	30	5	35	35	0	10	0
	U ⩽ 500 V	0	30	30	10 (1)	35	35	0	20	0
	U ⩽ 750 V	0	30	30	20 (1)	35	35	0	40	0
NSX400-630 DC	U ⩽ 250 V	0	30	30	5	60	60	0	10	0
	U ⩽ 500 V	0	30	30	10 (1)	60	60	0	20	0
	U ⩽ 750 V	0	30	30	20 (1)	100	100	0	40	0

(1) Distance must be doubled with interphase barriers.
(2) For Compact NSX DC with long or short terminal shields.
(3) For Compact NSX DC without terminal shields.

The mandatory distances when installing Compact NSX DC circuit breakers are calculated from the device case, not taking into account the terminal shields or the interphase barriers.

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Compact NSX100 to NSX630 DC
Temperature derating

These values are valid for fixed and withdrawable circuit breakers with or without terminal shields.

When the ambient temperature is greater than 40 °C, overload-protection characteristics are slightly modified.
To determine tripping times using time/current curves, use the values of the current indicated in the table below, corrected to take into account the ambient temperature.

Compact NSX DC temperature derating

NSX DC configuration	Type of trip unit	Rating In (A) for a given temperature						
		Ambient temp. 40 °C	Ambient temp. 45 °C	Ambient temp. 50 °C	Ambient temp. 55 °C	Ambient temp. 60 °C	Ambient temp. 65 °C	Ambient temp. 70 °C
NSX100 DC 1/2P 1P 250 V - 2P 500 V	TM16D	16	15.6	15.2	14.8	14.5	14	13.8
	TM25D	25	24.5	24	23.5	23	22	21
	TM32D	32	31.3	30.5	30	29.5	29	28.5
	TM40D	40	39	38	37	36	35	34
	TM50D	50	49	48	47	46	45	44
	TM63D	63	61.5	60	58	57	55	54
	TM80D	80	78	76	74	72	70	68
	TM100D	100	97.5	95	92.5	90	87.5	85
NSX160 DC 1/2P 1P 250 V - 2P 500 V	TM125D	125	122	119	116	113	109	106
	TM160D	160	156	152	147	144	140	136
NSX100 DC 3/4P ⩽ 500 V	TM16D	16.8	16.4	16	15.5	15.2	14.7	14.5
	TM25D	26.3	25.7	25.2	24.7	24.2	23.1	22.1
	TM32D	33.6	33	32	31.5	31	30.5	30
	TM40D	42	41	40	39	38	37	36
	TM50D	53	51	50	49	48	47	46
	TM63D	66	65	63	61	60	58	57
	TM80DC	84	82	80	78	76	74	71
	TM100DC	105	102	100	97	95	92	89
NSX160 DC 3/4P ⩽ 500 V	TM125DC	131	128	125	122	119	114	111
	TM160DC	168	164	160	154	151	147	143
NSX250 DC 3/4P ⩽ 500 V	TM200DC	210	205	200	194	189	184	179
	TM250DC	250	240	235	230	220	210	200
NSX100 DC 3/4P > 500 V	TM16D	16	15.6	15.2	14.8	14.5	14	13.8
	TM25D	25	24.5	24	23.5	23	22	21
	TM32D	32	31.3	30.5	30	29.5	29	28.5
	TM40D	40	39	38	37	36	35	34
	TM50D	50	49	48	47	46	45	44
	TM63D	63	61.5	60	58	57	55	54
	TM80DC	80	78	76	74	72	70	68
	TM100DC	100	97.5	95	92.5	90	87.5	85
NSX160 DC 3/4P > 500 V	TM125DC	125	122	119	116	113	109	106
	TM160DC	160	156	152	147	144	140	136
NSX250 DC > 500 V	TM200DC	200	195	190	185	180	175	170
	TM250DC	230	225	220	210	200	190	180
NSX400 DC ⩽ 500 V	P1-P2	400	400	400	400	400	400	400
NSX400 DC > 500 V	P1-P2	400	400	400	400	400	400	380
NSX630 DC ⩽ 500 V	P1-P2-P3	550	530	510	490	470	440	420
NSX630 DC > 500 V	P1-P2-P3	500	480	460	440	420	400	380

Example: a Compact NSX100 DC equipped with a TM80DC trip unit has a rating of:
- 84 A at 40 °C
- 78 A at 55 °C.

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Compact NSX100 to NSX630 DC

Characteristics of circuit breakers with parallel connection of poles

When poles are connected in parallel,the trip unit corresponding to the maximum circuit breaker rating is never used, for safety reasons related to temperature rise.The heating conditions are modified.The table opposite indicates the new thermal ratings that should be used for 2P, 3P and 4P circuit breakers.

Type of circuit breaker	Pole connections	Type of trip unit	Equivalent rated current (1) In (A) at 40 °C	Magnetic threshold Im (A) ±20 %
NSX100 DC				
NSX100 DC 2-pole	2P in parallel	TM16D	40	520
		TM25D	63	800
		TM32D	80	800
		TM40D	100	1400
		TM50D	125	1400
		TM63D	158	1400
See example 2 (see page A-33)		TM80D	200	1600
NSX100 DC 3-pole	3P in parallel	TM16D	58	780
		TM25D	90	1200
		TM32D	115	1650
		TM40D	144	2100
		TM50D	180	2100
		TM63D	227	2100
		TM80DC	288	2400
		TM16G	58	240
		TM25G	90	300
		TM40G	144	300
		TM63G	227	450
NSX100 DC 4-pole	4P in parallel	TM16D	74	1040
		TM25D	115	1600
		TM32D	147	2200
		TM40D	184	2800
		TM50D	230	2800
		TM63D	290	2800
		TM80DC	368	3200
		TM16G	74	320
		TM25G	115	400
		TM40G	184	400
		TM63G	290	600
	2 x 2P (in parallel) in series	TM16D	37	520
		TM25D	58	800
		TM32D	74	1100
		TM40D	46	1400
		TM50D	115	1400
		TM63D	145	1400
		TM80DC	184	1600
		TM16G	37	160
		TM25G	58	200
		TM40G	46	200
		TM63G	145	300

Type of circuit breaker	Pole connections	Type of trip unit	Equivalent rated current (1) In (A) at 40 °C	Magnetic threshold Im (A) ±20 %
NSX160 DC				
NSX160 DC 2-pole	2P in parallel	TM125D	313	2400
NSX160 DC 3-pole	3P in parallel	TM100DC	360	2400
		TM125DC	450	3750
NSX160 DC 4-pole	4P in parallel	TM100DC	460	3200
		TM125DC	575	5000
	2x2P (in parallel) in series	TM100DC	230	1600
See example 1 (see page A-33)		TM125DC	288	2500
NSX250 DC				
NSX250 DC 3-pole	2P in parallel	TM160DC	400	2500
		TM200DC	500	2000 to 4000
NSX250 DC 3-pole	3P in parallel	TM160DC	576	3750
		TM200DC	720	3000 to 6000
NSX250 DC 4-pole	4P in parallel	TM160DC	736	5000
		TM200DC	920	4000 to 8000
	2x2P (in parallel) in series	TM160DC	368	2500
		TM200DC	460	2000 to 4000
NSX400 DC				
NSX400 DC 3-pole	2P in parallel	MP1	640	1600 to 3200
		MP2	640	2500 to 5000
NSX400 DC 3-pole	3P in parallel	MP1	960	2400 to 4800
		MP2	960	3750 to 7500
NSX400 DC 4-pole	4P in parallel	MP1	1280	3200 to 6400
		MP2	1280	5000 to 10000
	2x2P (in parallel) in series	MP1	640	1600 to 3200
		MP2	640	2500 to 5000
NSX630 DC				
NSX630 DC 2-pole	2P in parallel	MP1	1000	1600 to 3200
		MP2	1000	2500 to 5000
		MP3	1000	4000 to 8000
NSX630 DC 3-pole	3P in parallel	MP1	1500	2400 to 4800
		MP2	1500	3750 to 7500
		MP3	1500	6000 to 12000
NSX630 DC 4-pole	4P in parallel	MP1	2000	3200 to 6400
		MP2	2000	5000 to 10000
		MP3	2000	8000 to 16000
	2x2P (in parallel) in series	MP1	1000	1600 to 3200
		MP2	1000	2500 to 50000
		MP3	1000	4000 to 8000

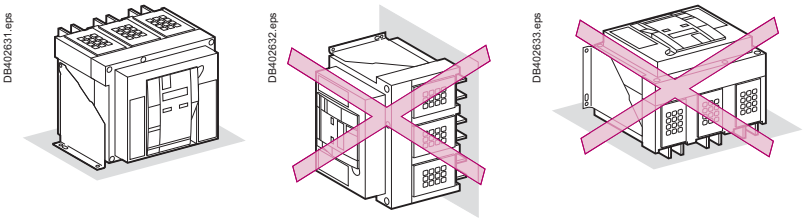
(1) Rated current of the assembly with the indicated pole connections.

Example : a Compact NSX100 DC 4-pole circuit breaker with 4 poles in parallel, equipped with a TM63D trip unit:
- an equivalent rated current of 290 A
- a fixed magnetic threshold of 2800 A.

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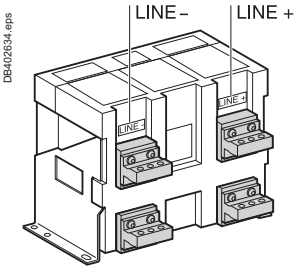
Masterpact NW10 to NW40 DC
Installation in switchboard

Possible positions



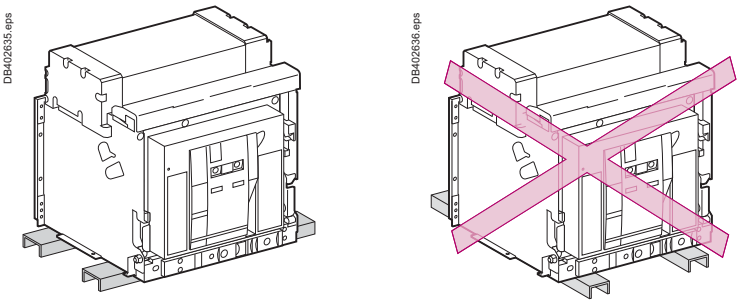
Power supply

The plus and minus polarities **(LINE + and LINE -)** of the power supply must be connected as indicated in the “Dimensions and connection” chapter.

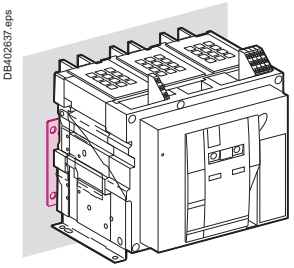


Mounting the circuit-breaker

It is important to distribute the weight of the device uniformily over a rigid mounting surface such as rails or a base plate.
This mounting plane should be perfectly flat (tolerance on support flatness: 2 mm). This eliminates any risk of deformation which could interfere with correct operation of the circuit breaker.
Masterpact devices can also be mounted on a vertical plane using the special brackets.



Mounting on rails.

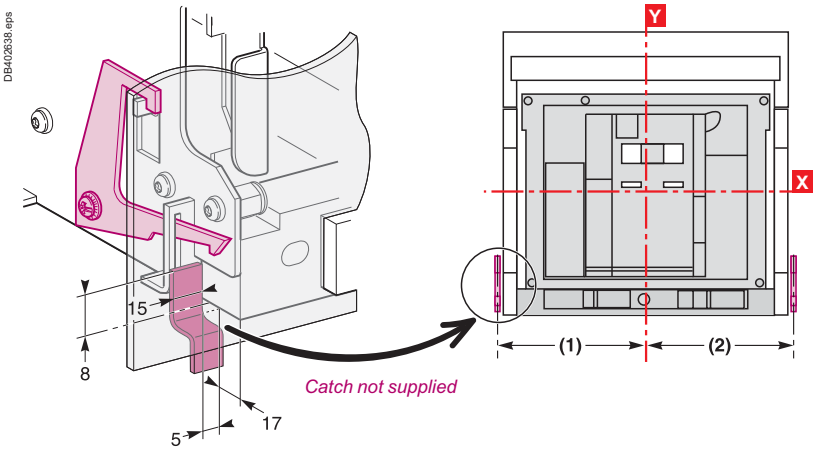


Mounting with vertical brackets.

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Mounted on the right or left-hand side of the craddle, this device inhibits opening of the cubicle door when the circuit breaker is in “connected” or “test” position. It the breaker is put in the “connected” position with the door open, the door may be closed without having to disconnect the circuit breaker.

Door interlock catch VPEC

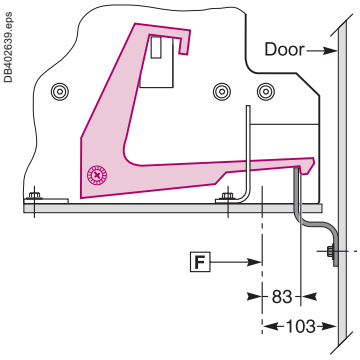


Dimensions (mm)

Type	(1)	(2)
NW10-40 DC (versions C-D)	215	215
NW10-40 DC (version E)	330	215

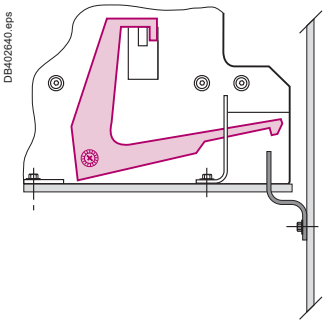
Breaker in “connected” or “test” position

Door cannot be opened



Breaker in “disconnected” position

Door can be opened



Note:
The door interlock can either be mounted on the right side or the left side of the breaker.

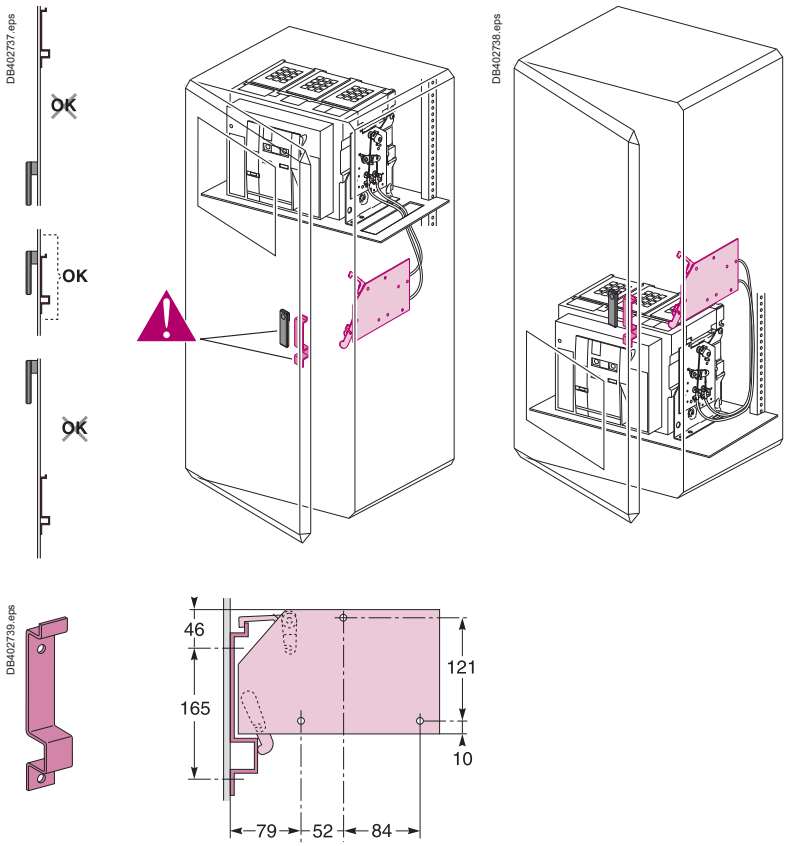
F: *Datum.*

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Masterpact NW10 to NW40 DC
Cable-type door interlock
Connection of MN, MX and XF voltage releases

Cable-type door interlock IPA

This option prevents door opening when the circuit breaker is closed and prevents circuit breaker closing when the door is open.
For this, a special plate associated with a lock and a cable is mounted on the right side of the circuit breaker.
With this interlock installed, the source changeover function cannot be implemented.



Wiring of voltage releases

During pick-up, the power consumed is approximately 150 to 200 VA. For low control voltages (12, 24, 48 V), maximum cable lengths are imposed by the voltage and the cross-sectional area of cables.

Recommended maximum cable lengths (meter)

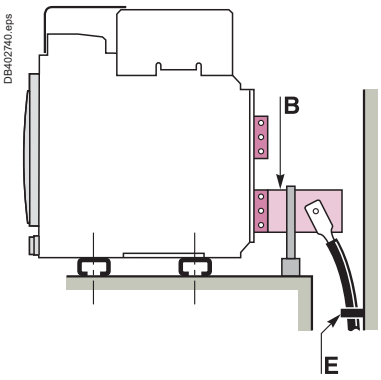
		12 V		24 V		48 V	
		2.5 mm²	1.5 mm²	2.5 mm²	1.5 mm²	2.5 mm²	1.5 mm²
MN	U source 100 %	-	-	58	35	280	165
	U source 85 %	-	-	16	10	75	45
MX-XF	U source 100 %	21	12	115	70	550	330
	U source 85 %	10	6	75	44	350	210

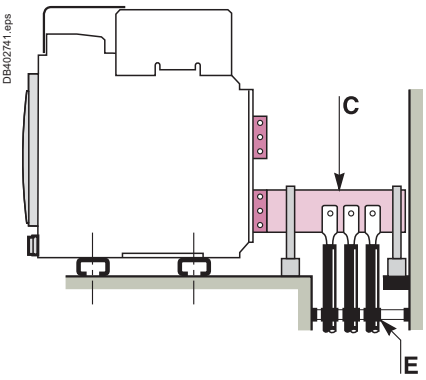
Note: *the indicated length is that of each of the two wires.*

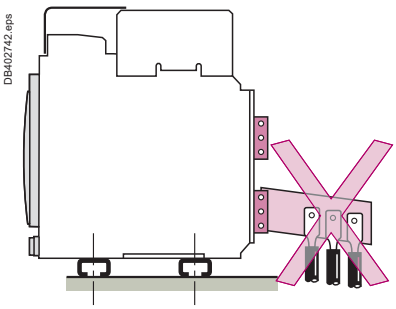
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Cable connections

If cables are used for the power connections, make sure that they do not apply excessive mechanical forces to the circuit breaker terminals.
For this, make the connections as follows:
■ extend the circuit breaker terminals using short bars designed and installed according to the recommendations for bar-type power connections:
□ for a single cable, use solution **B** opposite
□ for multiple cables, use solution **C** opposite.
■ in all cases, follow the general rules for connections to busbars:
□ position the cable lugs before inserting the bolts
□ the cables should firmly secured to the framework of the switchboard **E**.

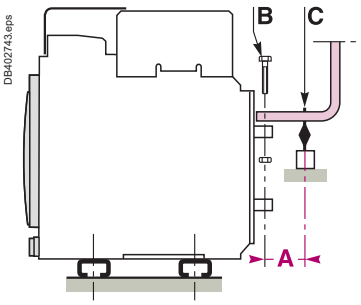


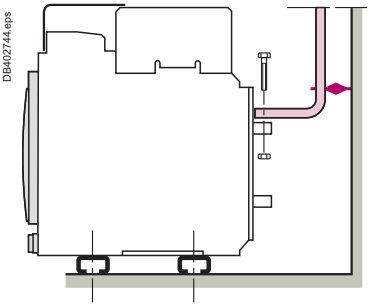


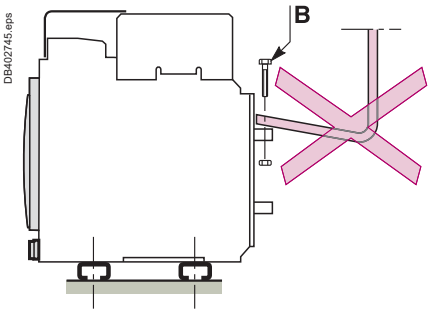


Busbar connections

The busbars should be suitably adjusted to ensure that the connection points are positioned on the terminals before the bolts are inserted **B**
The connections are held by the support which is solidly fixed to the framework of the switchboard, such that the circuit breaker terminals do not have to support its weight **C**. (This support should be placed close to the terminals).







Electrodynamic stresses

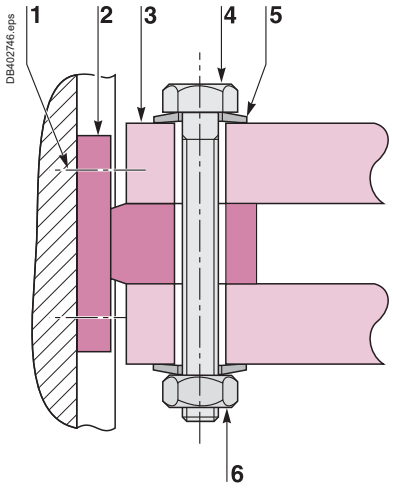
The first busbar support or spacer shall be situated within a maximum distance from the connection point of the breaker (see table below). This distance must be respected so that the connection can withstand the electrodynamic stresses between phases in the event of a short circuit.

Maximum distance A between busbar to circuit breaker connection and the first busbar support or spacer with respect to the value of the prospective short-circuit current.

Isc (kA)	30	50	65	80	100
distance A (mm)	350	300	250	150	150

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Masterpact NW10 to NW40 DC
Power connection

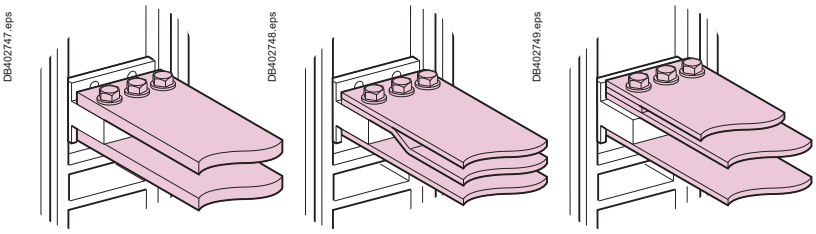


1 *Terminal screw factory-tightened to 16 Nm.*
2 *Breaker terminal.*
3 *Busbar.*
4 *Bolt.*
5 *Washer.*
6 *Nut.*

Clamping

Correct clamping of busbars depends amongst other things, on the tightening torques used for the nuts and bolts. Over-tightening may have the same consequences as under-tightening.
For connecting busbars (Cu ETP-NFA51-100) to the circuit breaker, the tightening torques to be used are shown in the table below.
These values are for use with copper busbars and steel nuts and bolts, class 8.8. The same torques can be used with AGS-T52 quality aluminium bars (French standard NFA 02-104 or American National Standard H-35-1).

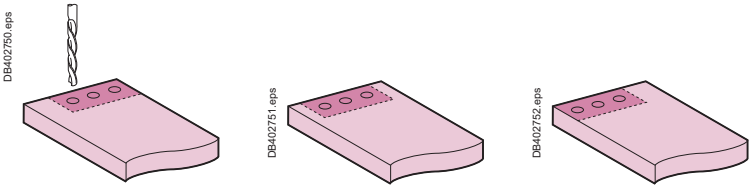
Examples



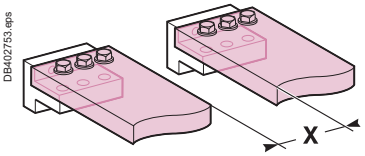
Tightening torques			
Ø Nominal (mm)	Ø Drilling (mm)	Tightening torque (Nm) with flat washers or split lockwashers	Tightening torque (Nm) with contact or serrated washers
10	11	37.5	50

Busbar drilling

Examples



Isolation distance

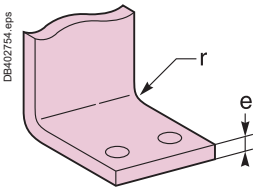


Dimensions (mm)

Ui	X mini
500 V DC	8 mm
900 V DC	14 mm

Busbar bending

When bending busbars maintain the radius indicated below (a smaller radius would cause cracks).

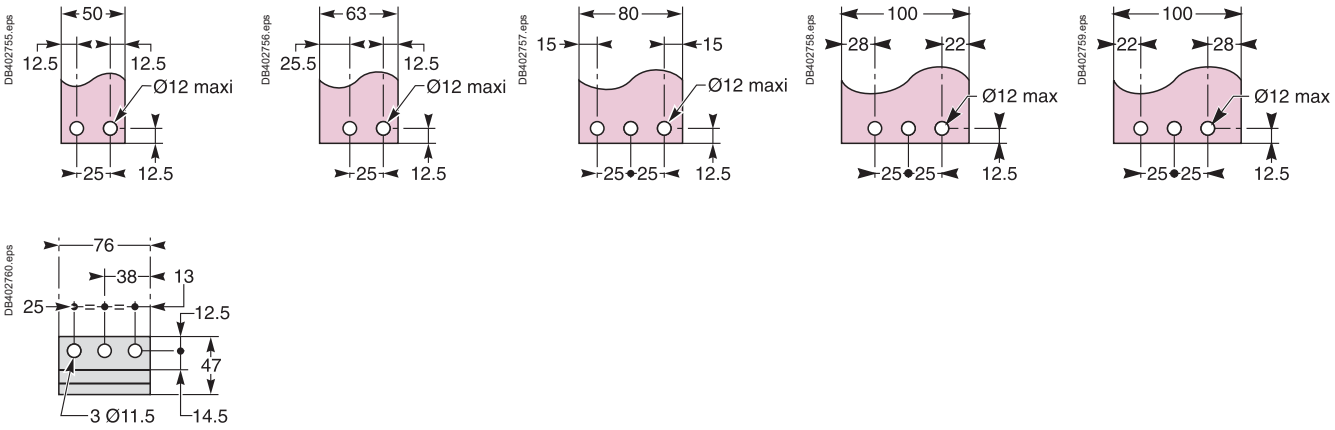


Dimensions (mm)

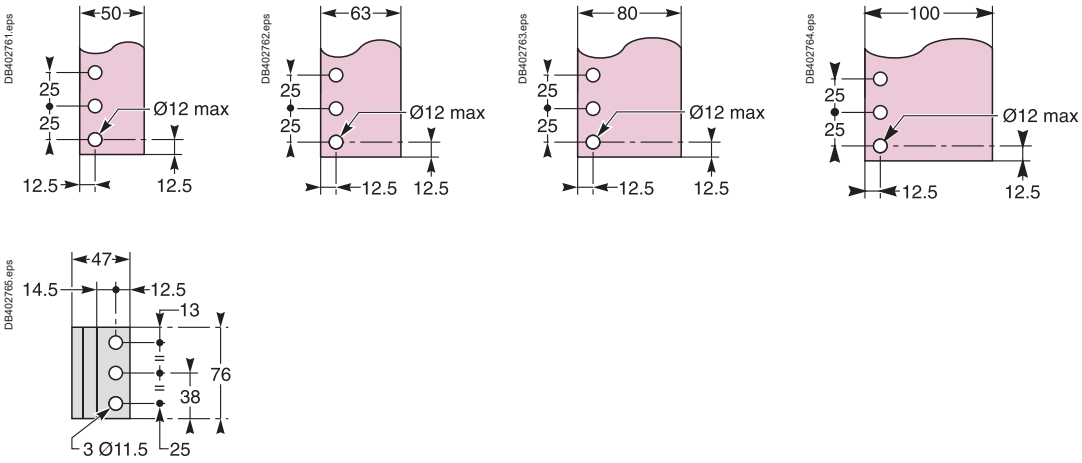
e	Radius of curvature r Min.	Recommended
5	5	7.5
10	15	18 to 20

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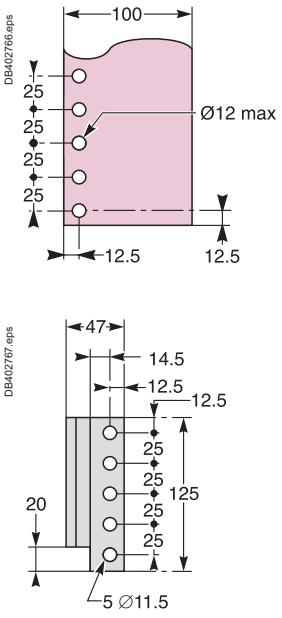
Horizontal rear connection NW10 to NW20 DC



Vertical rear connection NW10 to NW20 DC



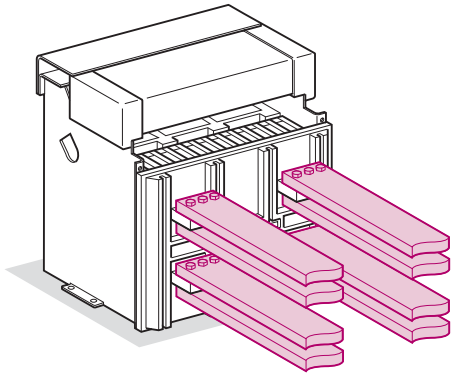
Vertical rear connection NW40 DC



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Masterpact NW10 to NW40 DC
Busbar sizing

DB402768.eps



Rear horizontal connection

Basis of tables

- maximum permissible busbar temperature: 100 °C
- Ti: temperature around the circuit breaker and its connections
- busbar material is unpainted copper.

Example

Conditions:

- drawout version
- horizontal busbars
- Ti: 50 °C
- service current: 2000 A.

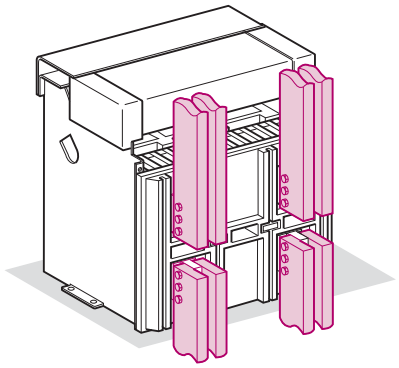
Solution

For Ti = 50 °C, use an NW20 DC which can be connected with three 100 x 5 mm bars or two 80 x 10 mm bars.

Masterpact	Maximum service current	Ti: 40 °C no. of bars		Ti: 50 °C no. of bars		Ti: 60 °C no. of bars	
		5 mm thick bars	10 mm thick bars	5 mm thick bars	10 mm thick bars	5 mm thick bars	10 mm thick bars
NW10 DC	**1000**	3b.50 x 5	1b.63 x 10	3b.50 x 5	2b.50 x 10	3b.63 x 5	2b.50 x 10
NW20 DC	**2000**	3b.100 x 5	2b.80 x 10	3b.100 x 5	2b.80 x 10	3b.100 x 5	3b.63 x 10

Note: *the values indicated in these tables have been extrapolated from test data and theoretical calculations. These tables are only intended as a guide and cannot replace industrial experience or a temperature rise test.*

DB402769.eps



Rear vertical connection

Basis of tables

- maximum permissible busbar temperature: 100 °C
- Ti: temperature around the circuit breaker and its connections
- busbar material is unpainted copper.

Example

Conditions:

- fixed version
- vertical busbars
- Ti: 40 °C
- service current: 1000 A.

Solution

For Ti = 40 °C, use an NW10 DC which can be connected with two 50 x 5 mm bars or one 50 x 10 mm bar.

Masterpact	Maximum service current	Ti: 40 °C no. of bars		Ti: 50 °C no. of bars		Ti: 60 °C no. of bars	
		5 mm thick bars	10 mm thick bars	5 mm thick bars	10 mm thick bars	5 mm thick bars	10 mm thick bars
NW10 DC	**1000**	2b.50 x 5	1b.50 x 10	2b.50 x 5	1b.50 x 10	2b.63 x 5	1b.63 x 10
NW20 DC	**2000**	3b.100 x 5	2b.63 x 10	3b.100 x 5	2b.63 x 10	3b.100 x 5	3b.80 x 10
NW40 DC	**4000**	-	4b.100 x 10	-	4b.100 x 10	-	4b.100 x 10

Note: *the values indicated in these tables have been extrapolated from test data and theoretical calculations. These tables are only intended as a guide and cannot replace industrial experience or a temperature rise test.*

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Temperature derating
Power dissipation and input / output resistance

Temperature derating

The table below indicates the maximum current rating, for each connection type, as a function of the ambient temperature around the circuit breaker and the busbars.
For ambient temperatures greater than 60 °C, consult us.
Ti: temperature around the circuit breaker and its connections.

Version		Drawout device										Fixed device									
Connection		Rear horizontal					Rear vertical					Rear horizontal					Rear vertical				
temp. Ti		40	45	50	55	60	40	45	50	55	60	40	45	50	55	60	40	45	50	55	60
NW10 DC	Version C	1000					1000					1000					1000				
	Version D	1000					1000					1000					1000				
	Version E	1000					1000					1000					1000				
NW20 DC	Version C	2000					2000					2000					2000				
	Version D	2000					2000					2000					2000				
	Version E	2000					2000					2000					2000				
NW40 DC	Version C	-					4000					-					4000				
	Version D	-					4000		3900	3750	3600	-					4000				
	Version E	-					4000		3800	3650	3500	-					4000				

Power dissipation and input/output resistance

Total power dissipation is the value measured at I_N, for a 3 pole (version C, D) or 4 pole (version E) breaker.

Version	Drawout device			Fixed device		
	Power dissipation (Watt)			Power dissipation (Watt)		
version	C	D	E	C	D	E
NW10 DC	45	75	105	25	40	60
NW20 DC	135	230	330	90	160	235
NW40 DC	460	800	1150	360	580	850

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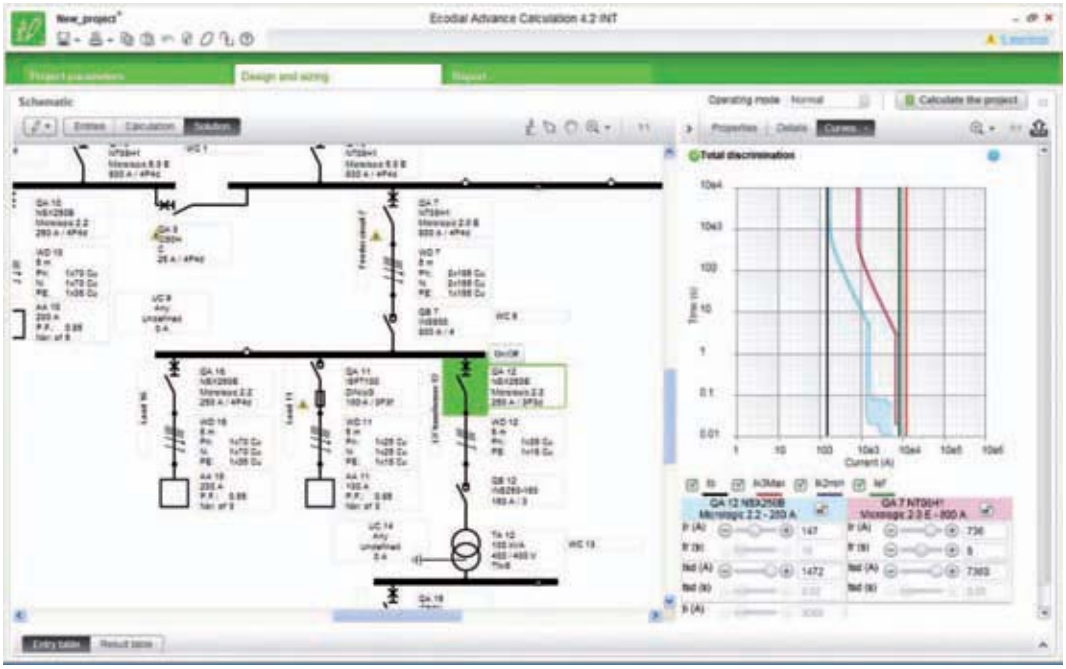
TOOLS

Ecodial

Ecodial software is dedicated to LV electrical installation calculation in accordance with the IEC60364 international standard or national standards.

This 4th generation, "Ecodial Advance Calculation 4", offers a new ergonomic and new features:

- operating mode that allows easy calculation in case of installation with different type of sources (parallel transformers, back-up generators...)
- discrimination analysis associating curves checking and discrimination tables
- direct access to protection settings including residual current protections
- easy selection of alternate solutions or manual selection of a product.



Schneider Electric
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Dimensions and connection

Presentation 2
Functions and characteristics A-1
Installation recommendations B-1

Compact (fixed version) 1P-2P NSX100-NSX160 N/H DC
Dimensions, mounting, cutout C-2

Dimensions and mounting
Compact NSX100 to 630 DC fixed version C-4
Compact NSX100 to 630 DC plug-in version C-6
Compact NSX100 to 630 DC withdrawable version C-8
Motor mechanism module for Compact NSX100 to 630 DC C-10
Direct rotary handle for Compact NSX100 to 630 DC C-11
MCC and CNOMO type direct rotary handles for Compact NSX100 to 630 DC fixed version C-12
Extended rotary handle for Compact NSX100 to 630 DC C-13

Front-panel accessories
Compact NSX100 to 630 DC C-14

Power connections
Compact NSX100 to 630 DC fixed version C-16
Connection of insulated bars or cables with lugs to Compact NSX100 to 630 DC C-20
Connection of bare cables to Compact NSX100 to 630 DC C-21

Compact (fixed version) 2P-3P-4P Parallel and series connection of poles
Compact NSX100 to NSX250 DC C-22
Compact NSX400 to NSX630 DC C-23

Compact (withdraw. version) 3P-4P Parallel and series connection of poles
Compact NSX100 to NSX250 DC C-24
Compact NSX400 to NSX630 DC C-25

Masterpact NW10 to 40 DC
Fixed device
Version C/D (3 poles) - Version E (4 poles) C-26
Fixed device - Version C C-27
Fixed device - Version D C-28
Fixed device - Version E C-29
Drawout device
Version C/D (3 poles) - Version E (4 poles) C-30
Drawout device - Version C C-31
Drawout device - Version D C-32
Drawout device - Version E C-33
Accessories C-34

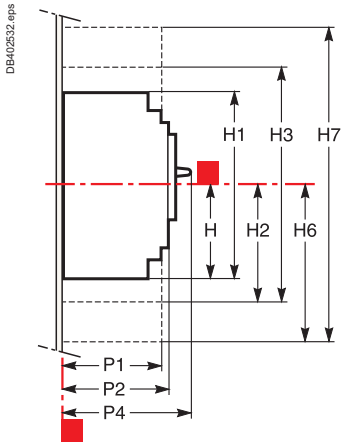
Electrical diagrams D-1
Additional characteristics E-1
Catalogue numbers and order form F-1

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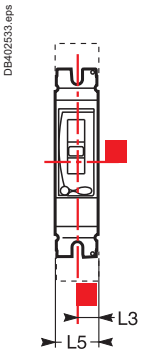
Compact (fixed version) 1P-2P NSX100-NSX160 N/H DC

Dimensions, mounting, cutout

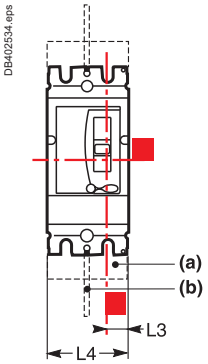
Dimensions



1 pole



2 poles

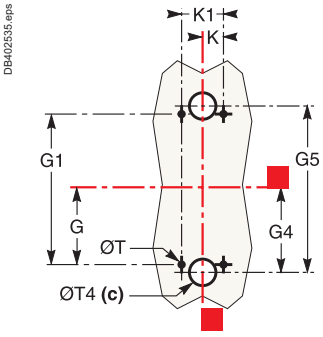


(a) Short terminal shields.
(b) Interphase barriers.

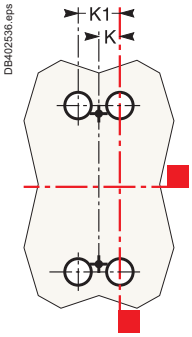
Mounting

On backplate

1 pole



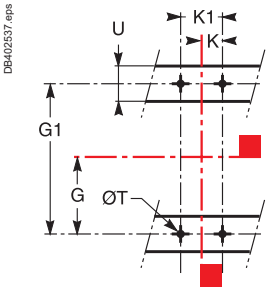
2 poles



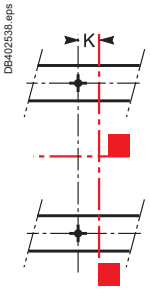
(c) For rear connection only.

On rails

1 pole



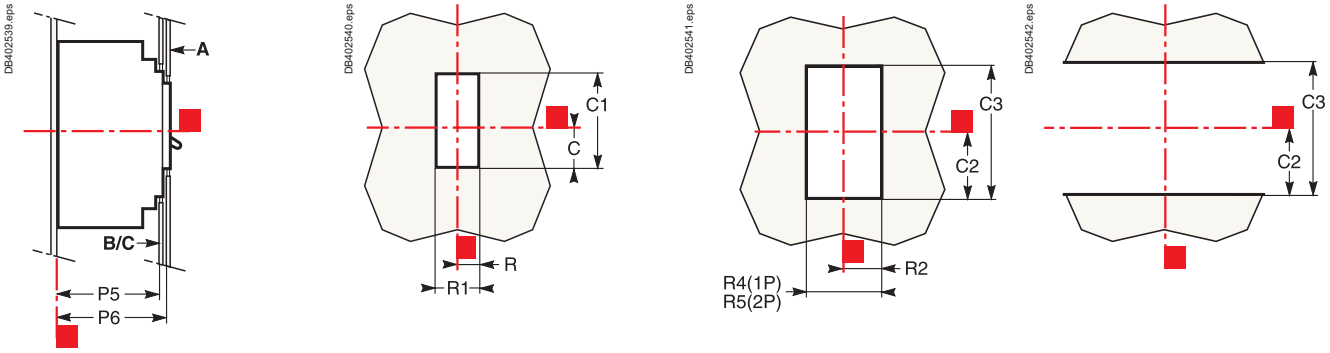
2 poles



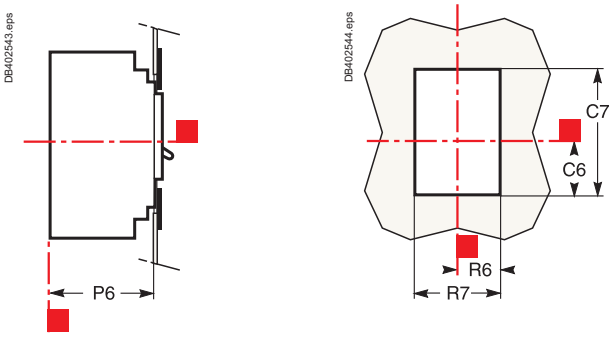
For reference only. www.fengshengelectric.com.sg

Front-panel cutout

On backplate



With escutcheon



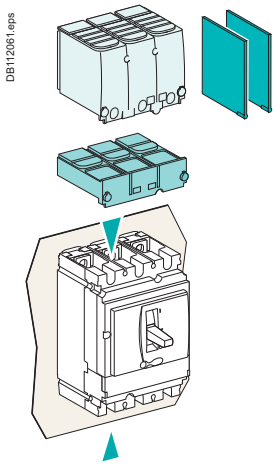
Dimensions (mm)

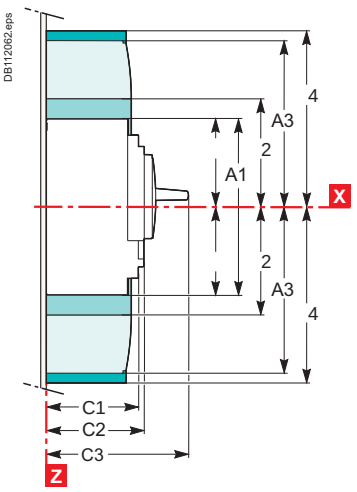
Type	C	C1	C2	C3	C6	C7	G	G1	G4	G5	H
NSX100/160N/H DC	29	76	54	108	43	104	62.5	125	70	140	80.5
Type	**H1**	**H2**	**H3**	**H4**	**H6**	**H7**	**K**	**K1**	**L3**	**L4**	**L5**
NSX100/160N/H DC	161	94	188	160.5	178.5	357	17.5	35	17.5	70	35
Type	**P1**	**P2**	**P4**	**P5**	**P6**	**R**	**R1**	**R2**	**R4**	**R5**	**R6**
NSX100/160N/H DC	81	86	111	83	88	14.5	29	19	38	73	29
Type	**R7**	**ØT**	**ØT4**	**U**							
NSX100/160N/H DC	58	6	22	⩽ 32							

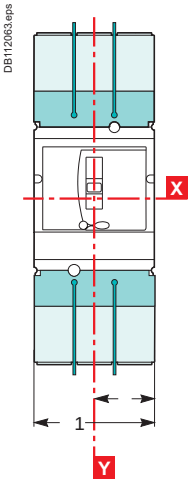
For reference only. www.fengshengelectric.com.sg

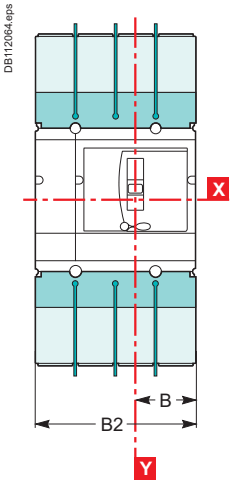
Dimensions and mounting
Compact NSX100 to 630 DC fixed version

Dimensions	3P	4P





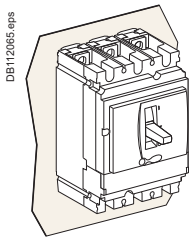


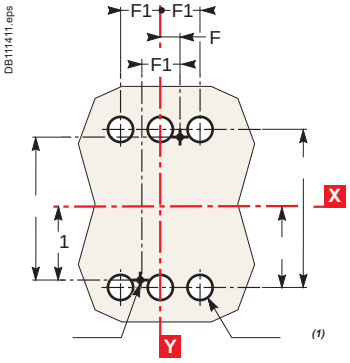


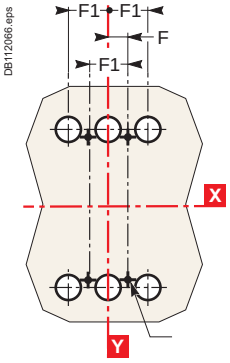
Interphase barriers.
Short terminal shields.

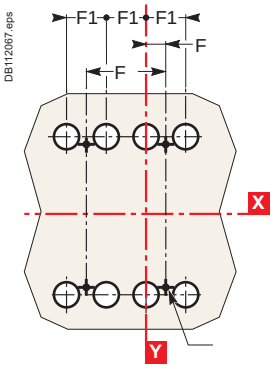
Long terminal shields (also available for NSX400/630 DC spreaders with 52.5 mm pitch: B1 = 157.5 mm, B2 = 210 mm).

Mounting	NSX100 to 250 DC	NSX400/630 DC	NSX100 to 630 DC
On backplate	**3P**	**3P**	**4P**



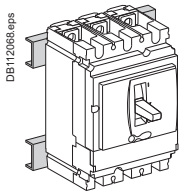


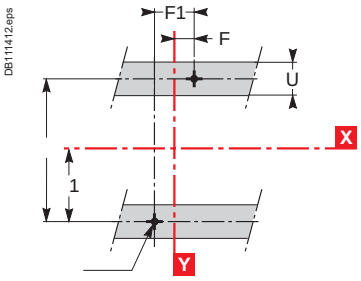


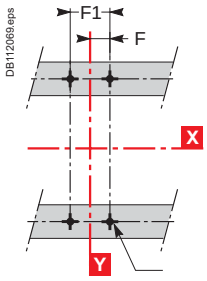


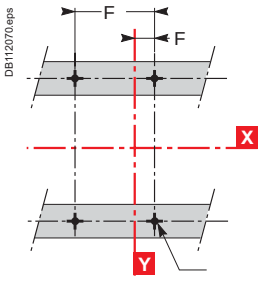
(1) The ØT holes are required for rear connection only.

On rails	3P	3P	4P





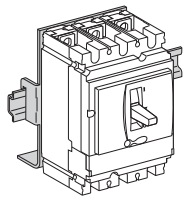




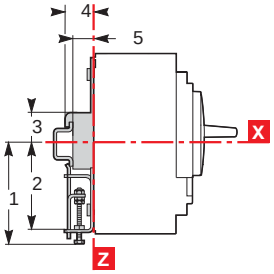
For reference only. www.fengshengelectric.com.sg

On DIN rail with adapter plate (NSX100 to 250 DC)

DB112071.eps



DB112072.eps

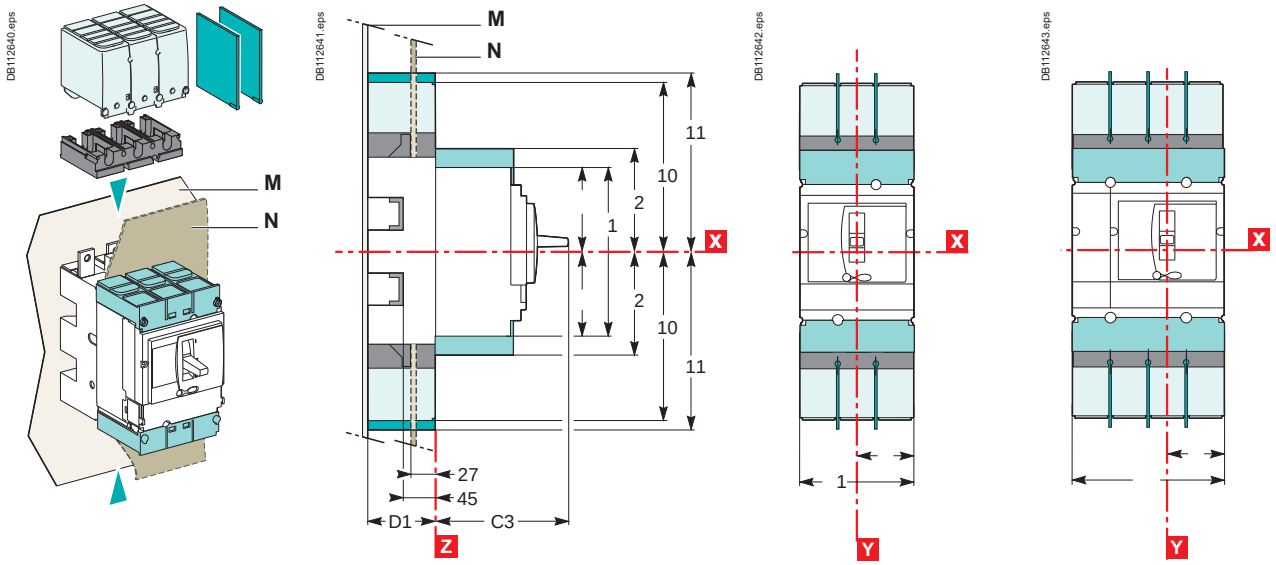


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Dimensions and mounting
Compact NSX100 to 630 DC plug-in version

Dimensions

3P 4P



Interphase barriers for base.

Short terminal shields on circuit breaker.

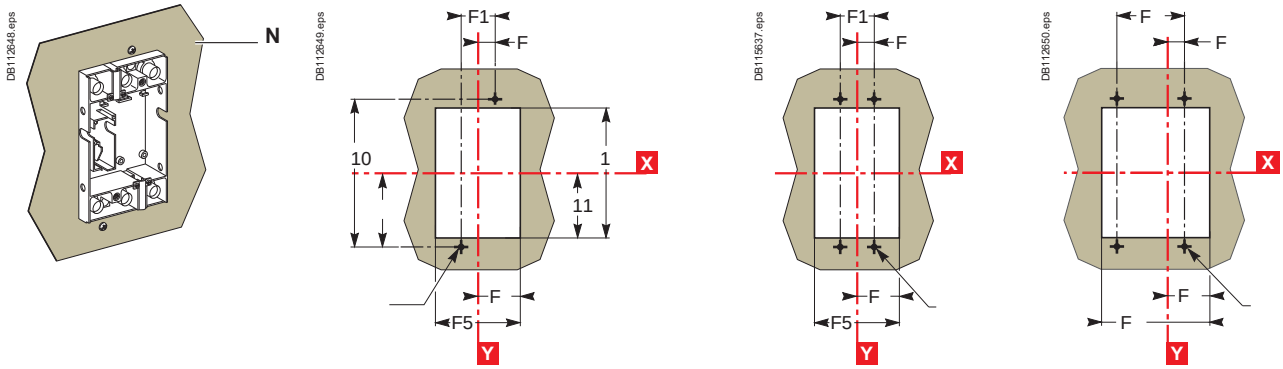
Long terminal shields (also available for NSX400/630 DC spreaders with 52.5 mm pitch: B1 = 157.5 mm, B2 = 210 mm)

Adapter for base, required to mount long terminal shields or interphase barriers.

Mounting

Through front panel (N)

3P	3P	4P
NSX100 to 250 DC	**NSX400/630 DC**	**NSX100 to 630 DC**

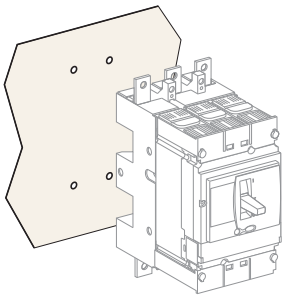


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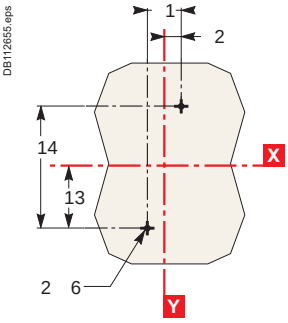
On backplate (M) 3P 4P

Front connection (an insulating screen is supplied with the base and must be fitted between the base and the backplate)

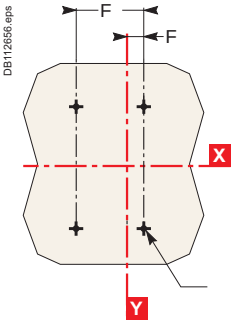
DB112654.eps



DB112655.eps

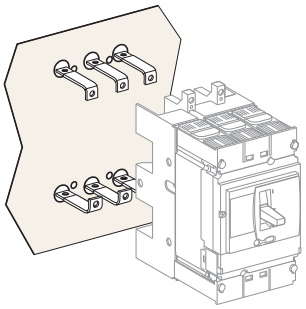


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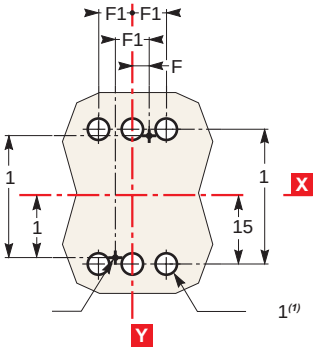


Connection by exterior-mounted rear connectors

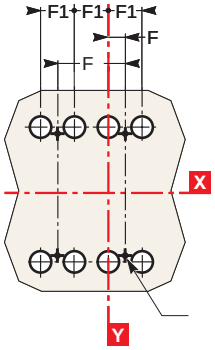
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DB112658.eps



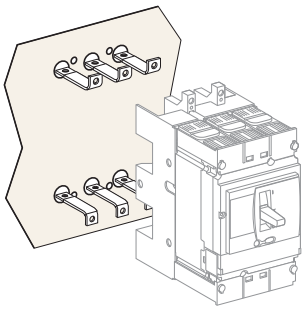
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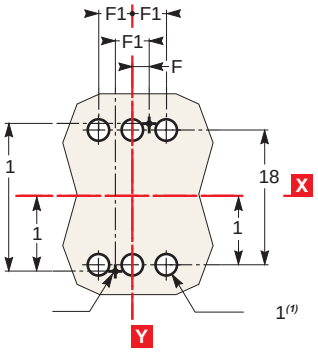
(1) The ØT1 holes are required for rear connection only.

Connection by interior-mounted rear connectors

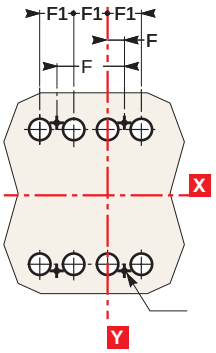
DB112660.eps



DB112661.eps



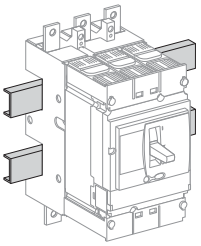
DB112662.eps



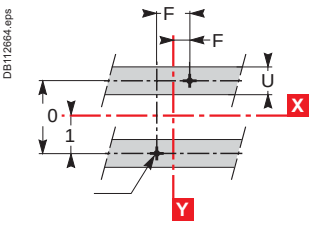
(1) The ØT1 holes are required for rear connection only.

On rails 3P 4P

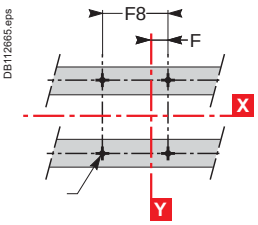
DB112663.eps



DB112664.eps



DB112665.eps



Type	A	A1	A2	A10	A11	B	B1	B2	C3	D1	E9	E10	E11	E12	E13	E14	E15
NSX100/160/250 DC	80.5	161	94	175	210	52.5	105	140	126	75	95	190	87	174	77.5	155	79
NSX400/630 DC	127.5	255	142.5	244	281	70	140	185	168	100	150	300	137	274	125	250	126

Type	E16	E17	E18	E19	E20	F1	F2	F3	F4	F5	F6	F7	F8	F9	ØT1	U
NSX100/160/250 DC	158	61	122	37.5	75	35	17.5	70	54.5	109	144	70	105	35	24	⩽ 32
NSX400/630 DC	252	101	202	75	150	45	22.5	90	71.5	143	188	100	145	50	33	⩽ 35

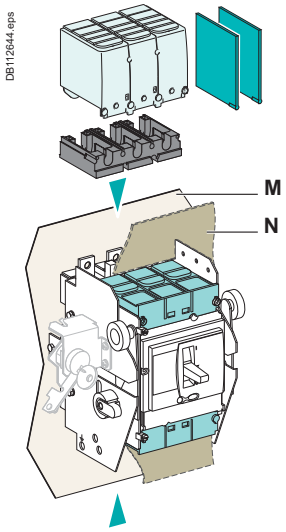
For reference only. www.fengshengelectric.com.sg

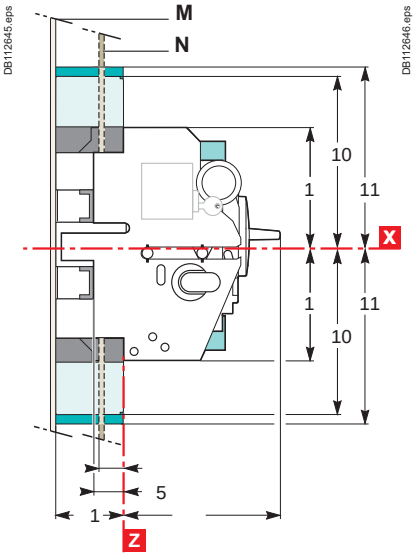
Dimensions and mounting

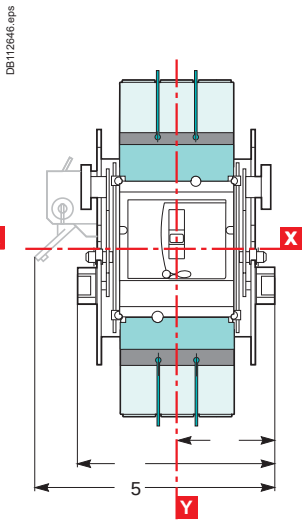
Compact NSX100 to 630 DC withdrawable version

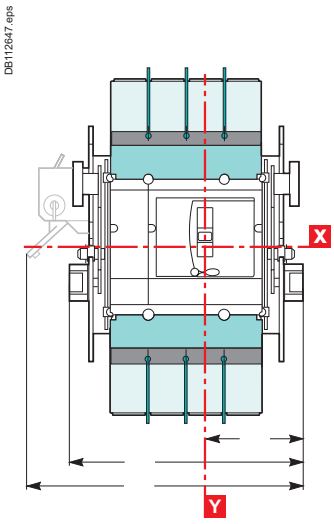
Dimensions

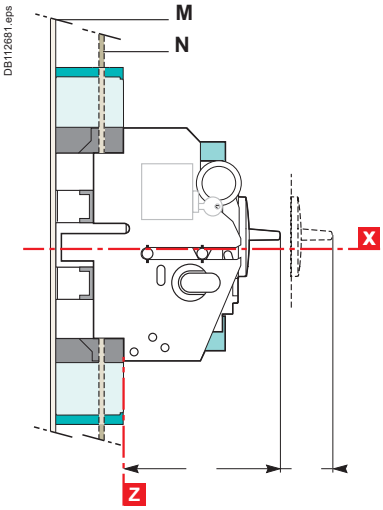
3P 4P









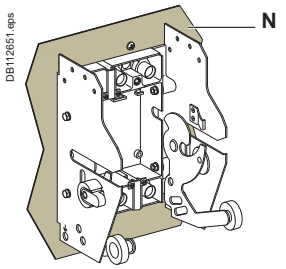


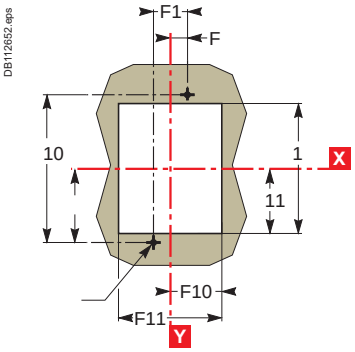
Interphase barriers for base.
Short terminal shields on circuit breaker.
Long terminal shields.
Adapter for base, required to mount long terminal shields or interphase barriers.

Mounting

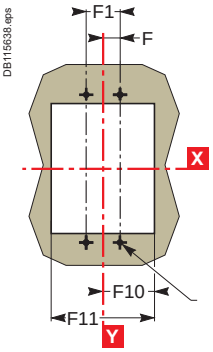
Through front panel (N)

3P NSX100 to 250 DC

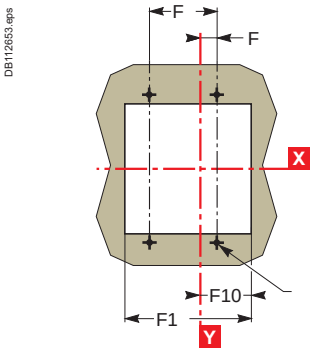




3P NSX400/630 DC



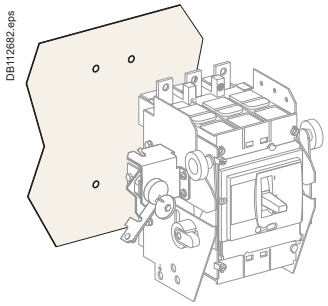
4P NSX100 to 630 DC

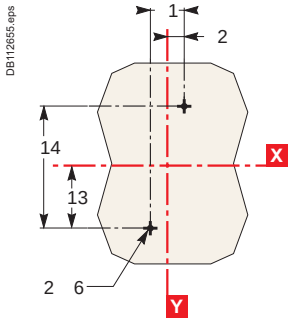


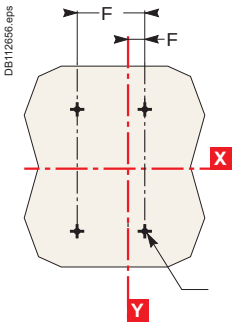
For reference only. www.fengshengelectric.com.sg

On backplate (M) 3P 4P

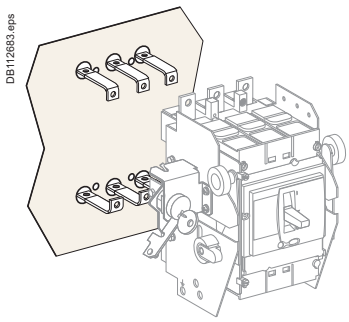
Front connection (an insulating screen is supplied with the base and must be fitted between the base and the backplate)

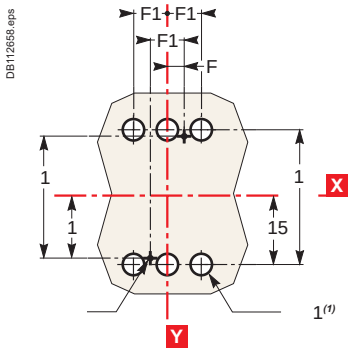


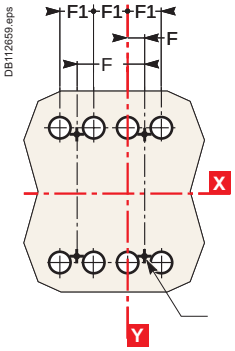




Connection by exterior-mounted rear connectors

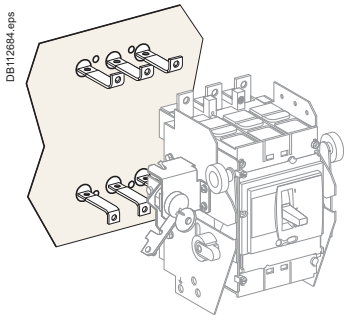


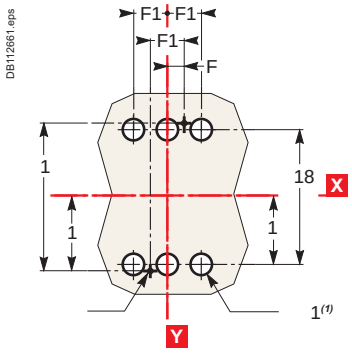


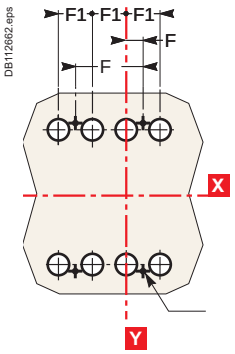


(1) The ØT1 holes are required for rear connection only.

Connection by interior-mounted rear connectors

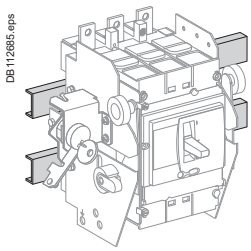


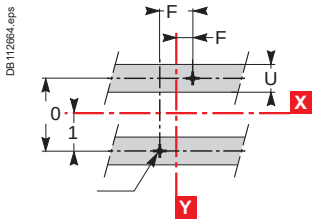


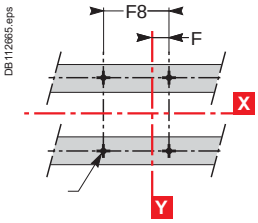


(1) The ØT1 holes are required for rear connection only.

On rails 3P 4P







Type	A10	A11	A12	A13	B3	B4	B5	B6	B7	C3	D1	E9	E10	E11	E12	E13	E14
NSX100/160/250 DC	175	210	106.5	103.5	92.5	185	216	220	251	126	75	95	190	87	174	77.5	155
NSX400/630 DC	244	281	140	140	110	220	250	265	295	168	100	150	300	137	274	125	250
Type	**E15**	**E16**	**E17**	**E18**	**E19**	**E20**	**F1**	**F2**	**F3**	**F7**	**F8**	**F9**	**F10**	**F11**	**F12**	**ØT1**	**U**
NSX100/160/250 DC	79	158	61	122	37.5	75	35	17.5	70	70	105	35	74	148	183	24	⩽ 32
NSX400/630 DC	126	252	101	202	75	150	45	22.5	90	100	145	50	91.5	183	228	33	⩽ 35

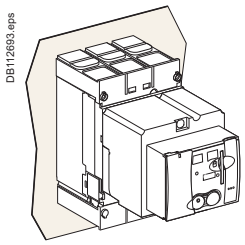
For reference only. www.fengshengelectric.com.sg

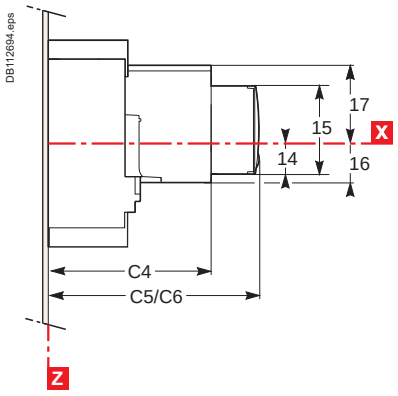
Dimensions and mounting

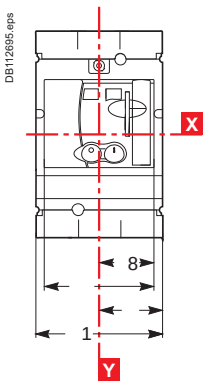
Motor mechanism module for Compact NSX100 to 630 DC

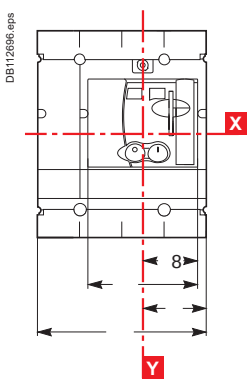
Dimensions — 3P — 4P

Fixed circuit breaker



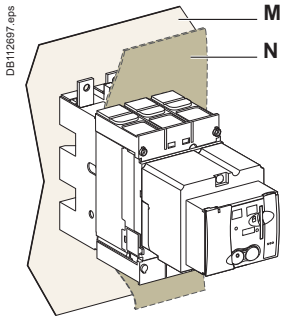


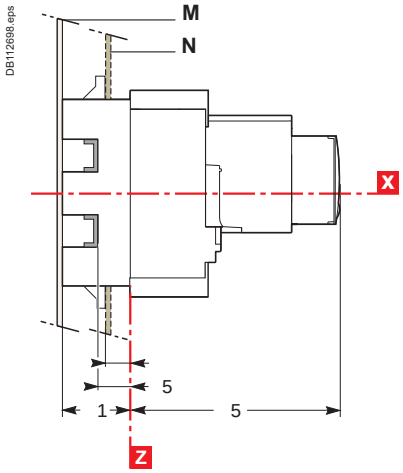




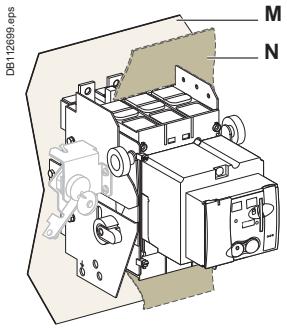
C5: without keylock
C6: with keylock

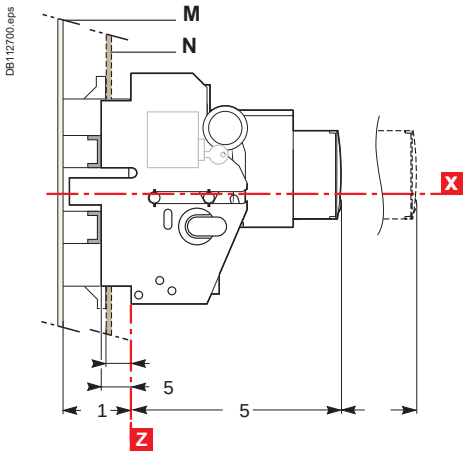
Plug-in circuit breaker





Withdrawable circuit breaker





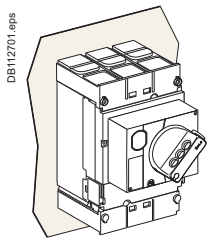
Type	A14	A15	A16	A17	B	B1	B2	B8	B9	C4	C5	C6	D1
NSX100/160/250 DC	27.5	73	34.5	62.5	52.5	105	140	45.5	91	143	182	209.5	75
NSX400/630 DC	40	123	52	100	70	140	185	61.5	123	215	256	258	100

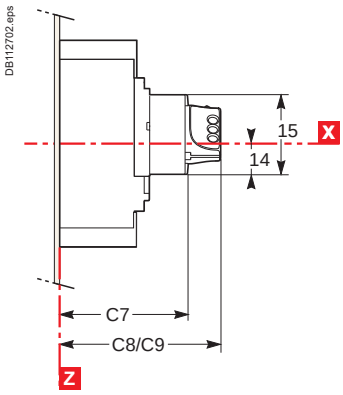
For reference only. www.fengshengelectric.com.sg

Direct rotary handle
for Compact NSX100 to 630 DC

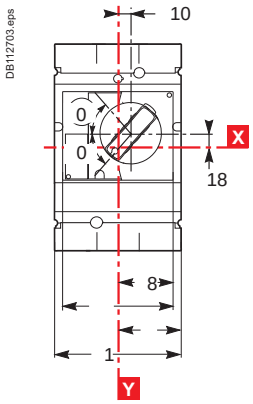
Dimensions

Fixed circuit breaker

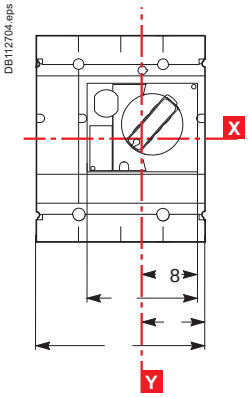




3P

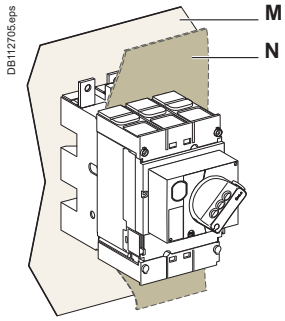


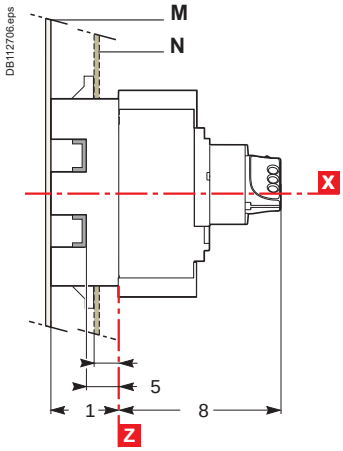
4P



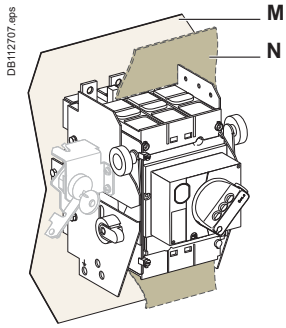
C8: without keylock
C9: with keylock

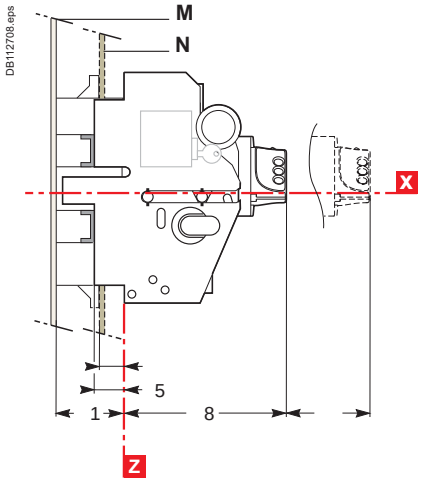
Plug-in circuit breaker





Withdrawable circuit breaker





Type	A14	A15	A18	B	B1	B2	B8	B9	B10	C7	C8	C9	D1
NSX100/160/250 DC	27.5	73	9	52.5	105	140	45.5	91	9.25	121	155	164	75
NSX400/630 DC	40	123	24.6	70	140	185	61.5	123	5	145	179	188	100

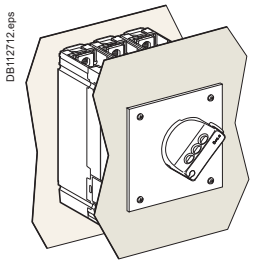
For reference only. www.fengshengelectric.com.sg

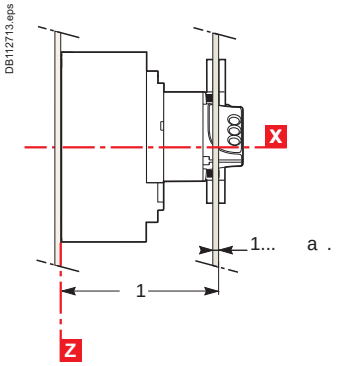
Dimensions and mounting

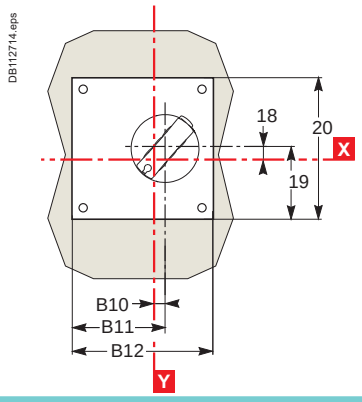
MCC and CNOMO type direct rotary handles for Compact NSX100 to 630 DC fixed version

Dimensions

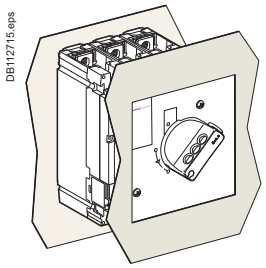
MCC type direct rotary handle

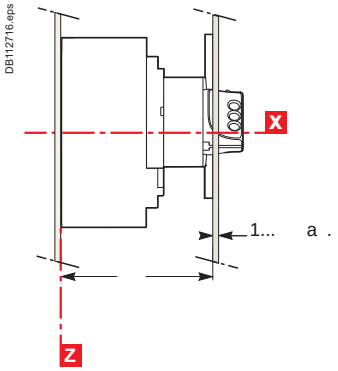


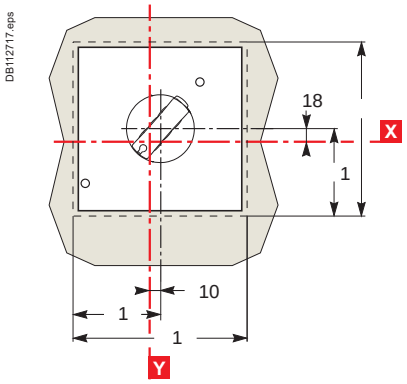




CNOMO type direct rotary handle



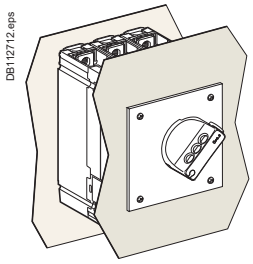


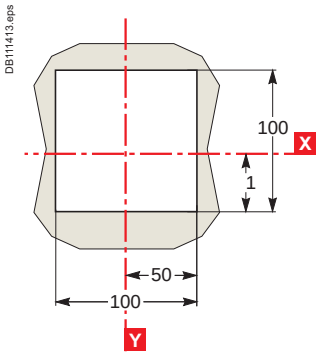


Front-panel cutout

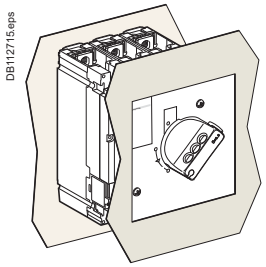
NSX100 to 250 DC

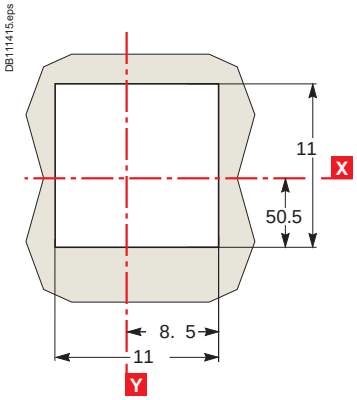
MCC type direct rotary handle





CNOMO type direct rotary handle

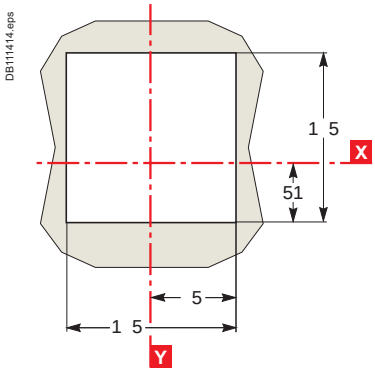




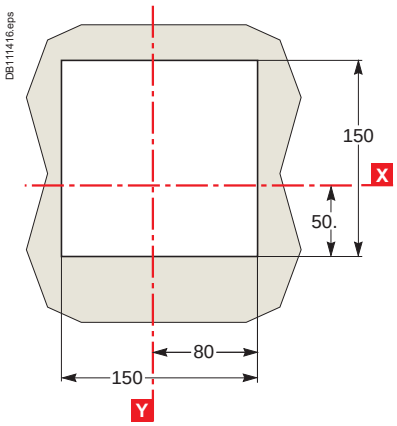
Type	A18	A19	A20	A21	A22	B10
NSX100/160/250 DC	9	60	120	65	130	9.25
NSX400/630 DC	24.6	83	160	82	164	5
Type	**B11**	**B12**	**B13**	**B14**	**P1**	**P2**
NSX100/160/250 DC	69	120	65	130	125	135
NSX400/630 DC	85	160	82	164	149	158

NSX400/630 DC

MCC type direct rotary handle



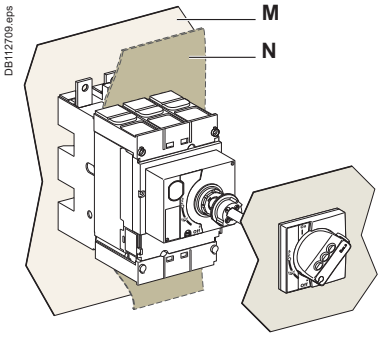
CNOMO type direct rotary handle

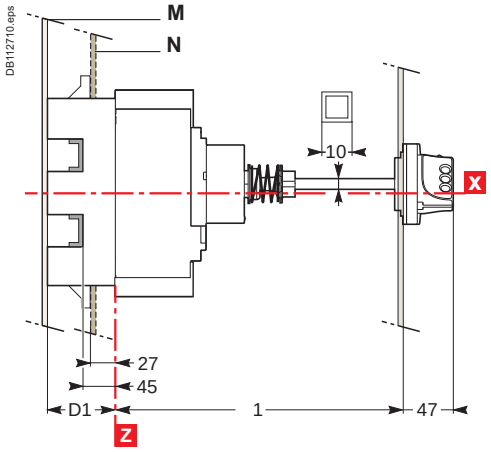


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Dimensions

Fixed and plug-in circuit breakers

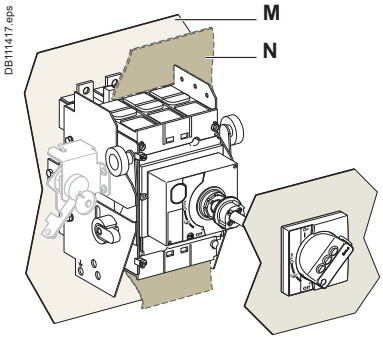


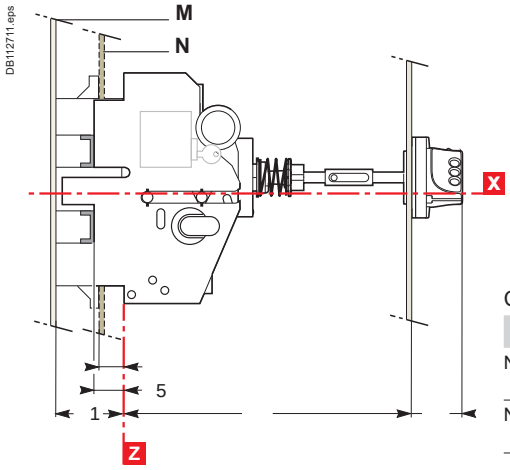


Cutout for shaft (mm)

Type	R1
NSX100/160/250 DC	min. 171 max. 600
NSX400/630 DC	min. 195 max. 600

Withdrawable circuit breaker

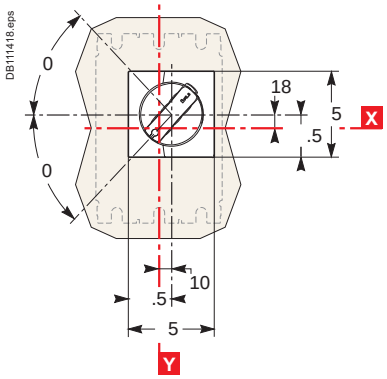


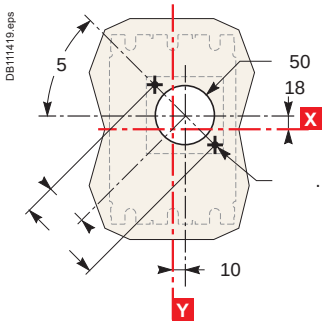


Cutout for shaft (mm)

Type	R2
NSX100/160/250 DC	min. 248 max. 600
NSX400/630 DC	min. 272 max. 600

Dimensions and front-panel cutout





Type	A18	B10	D1
NSX100/160/250 DC	9	9.25	75
NSX400/630 DC	24.6	5	100

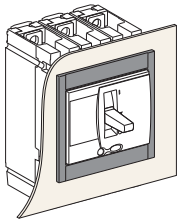
For reference only. www.fengshengelectric.com.sg

Front-panel accessories
Compact NSX100 to 630 DC

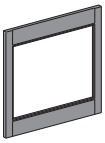
IP30 front-panel escutcheons

For toggle, rotary handle or motor mechanism module

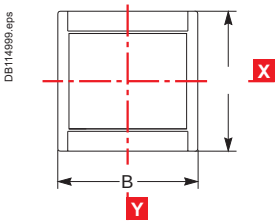
DB114997.eps



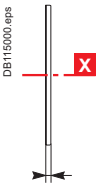
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DB114999.eps

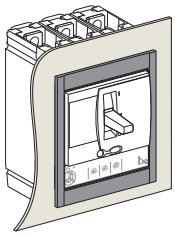


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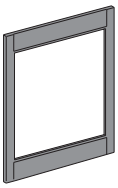


For toggle or rotary handle with access to trip unit

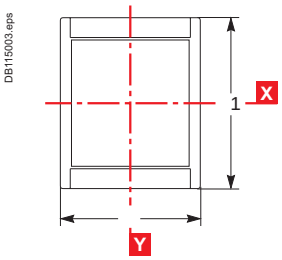
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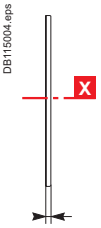
DB115002.eps



DB115003.eps



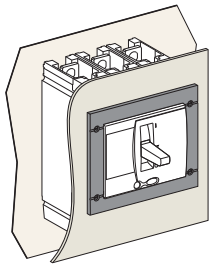
DB115004.eps



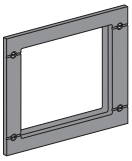
IP40 front-panel escutcheons

For toggle, rotary handle or motor mechanism module and protection collar

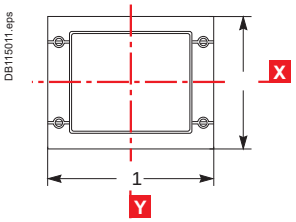
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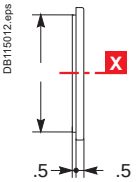
DB115010.eps



DB115011.eps



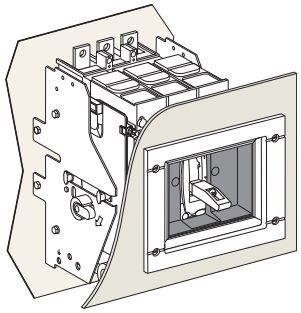
DB115012.eps



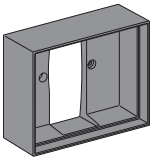
Protection collars for IP40 front-panel escutcheons

For toggle

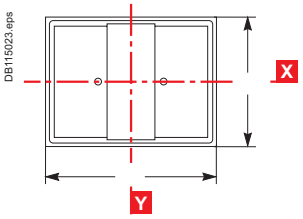
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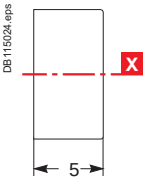
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DB115023.eps



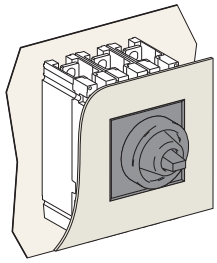
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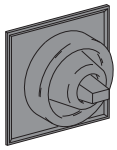
For reference only. www.fengshengelectric.com.sg

IP43 toggle cover

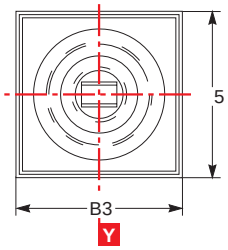
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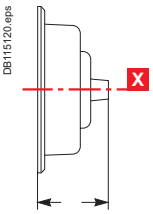
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DB115032.eps



DB115120.eps



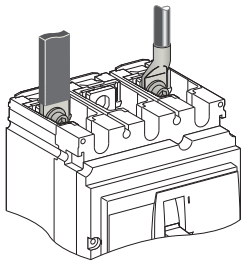
Type	A	A1	A2	A3	A4	A5	B	B1	B2	B3	C
NSX100/160/250 DC	113	138	114	101	73	85	113	157	91	103	40
NSX400/630 DC	163	211	164	151	122.5	138	163	189	122.5	138	60

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Power connections
Compact NSX100 to 630 DC fixed version

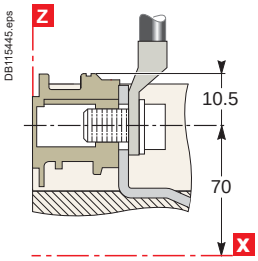
Front connection without accessories

DB115444.eps



NSX100 to 250 DC

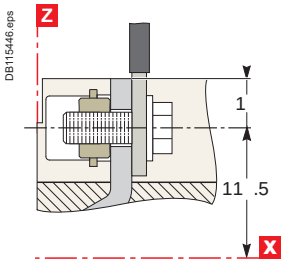
DB115445.eps



Cables with lugs/bars

NSX400/630 DC

DB115446.eps

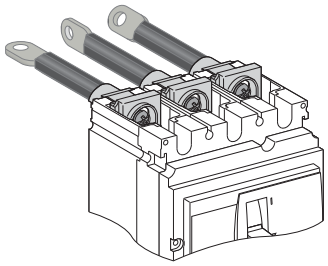


Bars/cables with lugs

Connection with accessories

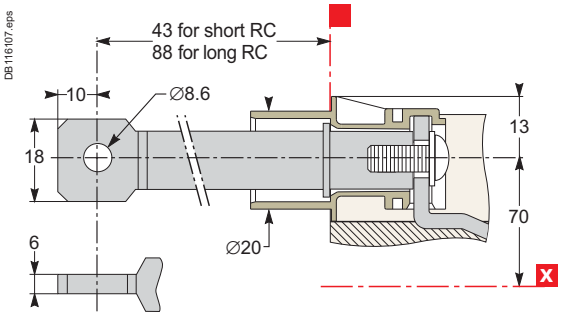
Long and short rear connectors

DB115447.eps



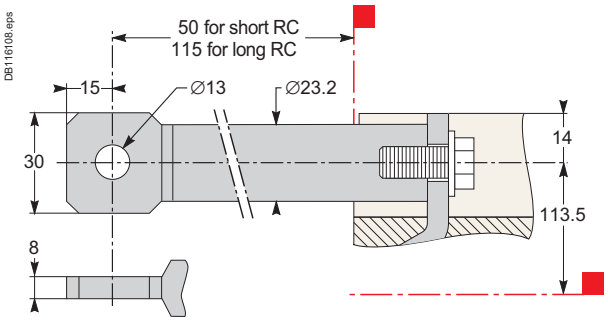
NSX100 to 250 DC

DB116107.eps



NSX400/630 DC

DB116108.eps

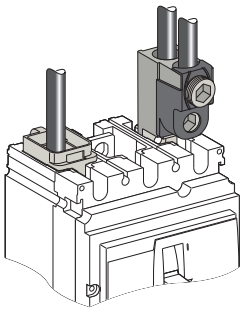


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Connection with accessories (cont.)

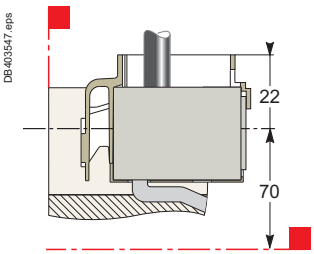
Bare-cable connectors

DB115450.eps

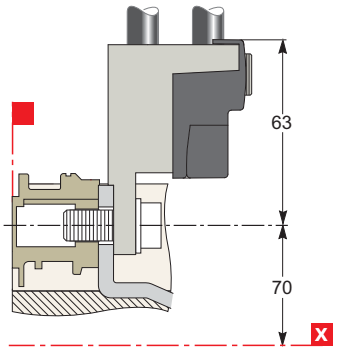


NSX100 to 250 DC

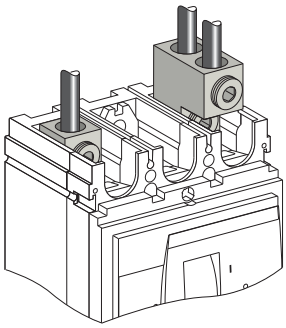
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DB403548.eps

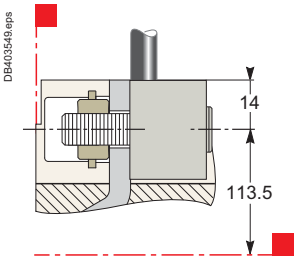


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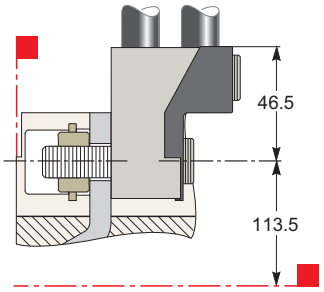


NSX400/630 DC

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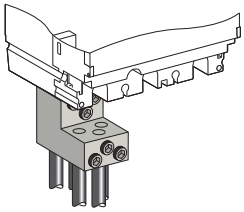


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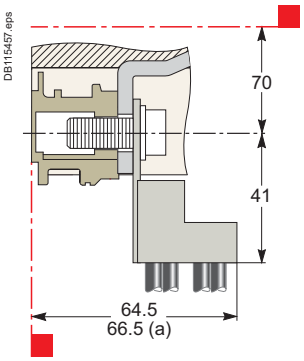


Distribution connectors (for NSX100 to 250 DC only)

DB115456.eps



DB115457.eps

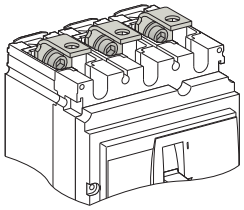


(a) NSX250 DC.

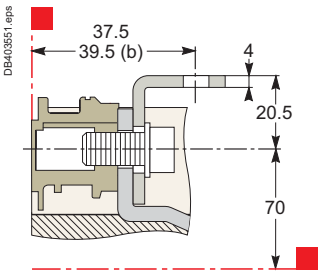
Right-angle terminal extensions (upstream only)

NSX100 to 250 DC

DB115458.eps

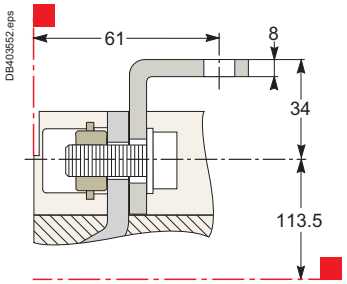


DB403551.eps



NSX400/630 DC

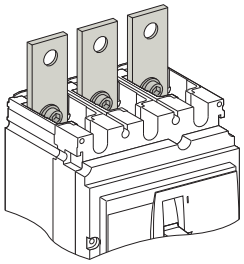
DB403552.eps



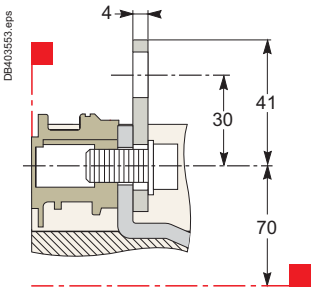
(b) NSX250 DC.

Straight terminal extensions (for NSX100 to 250 DC only)

DB115461.eps



DB403553.eps

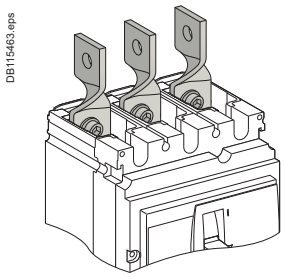


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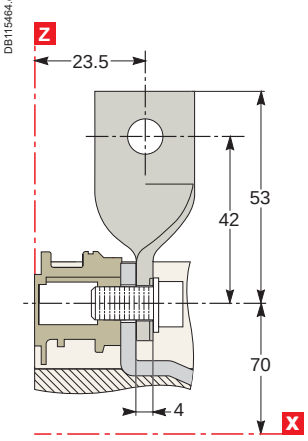
Power connections
Compact NSX100 to 630 DC fixed version

Connection with accessories (cont.)

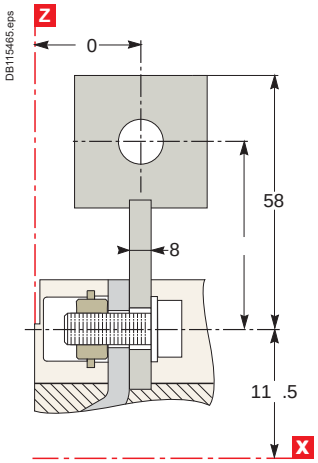
Edgewise terminal extensions



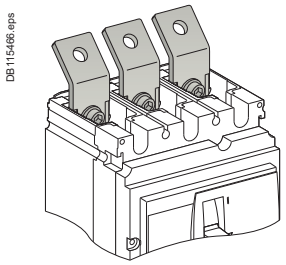
NSX100 to 250 DC



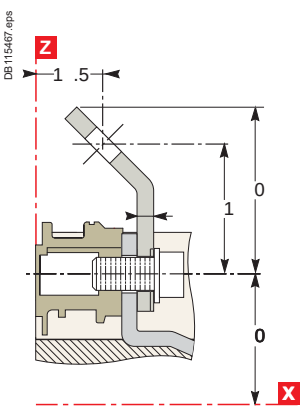
NSX400/630 DC



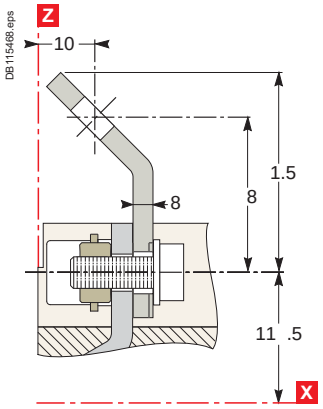
45° terminal extensions



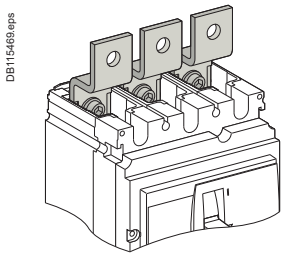
NSX100 to 250 DC



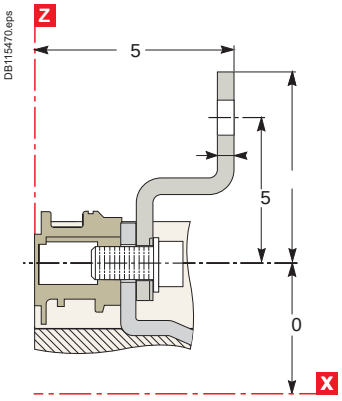
NSX400/630 DC



Double-L terminal extensions



NSX100 to 250 DC



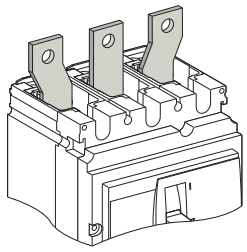
For reference only. www.fengshengelectric.com.sg

Connection with accessories (cont.)

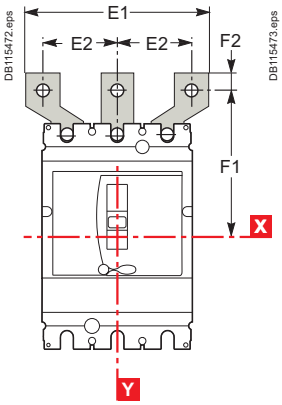
Spreaders **3P** **4P**

NSX100 to 250 DC

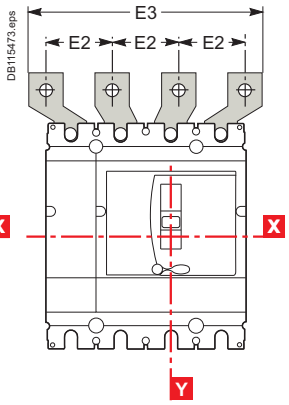
DB115471.eps



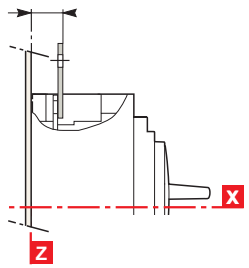
DB115472.eps

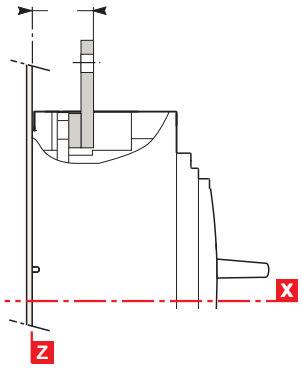


DB115473.eps



DB115474.eps





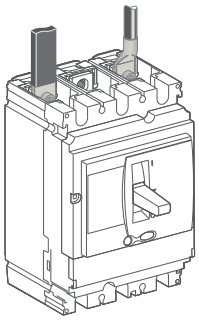
Type	C3	C4	E1	E2	E3	F1	F2
NSX100/160 DC	23.5	-	114	45	159	100	11
NSX250 DC	25.5	-	114	45	159	100	11
NSX400/630 DC	-	44	135 170	52.5 70	187.5 240	152.5 166	15 15

For reference only. www.fengshengelectric.com.sg

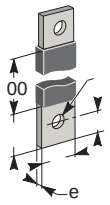
Power connections

Connection of insulated bars or cables with lugs to Compact NSX100 to 630 DC

DB112168.eps

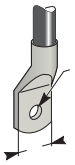


DB115653.eps



Bar.

DB115654.eps



Lug.

Direct connection to NSX100 to 630 DC

Dimensions		NSX100 DC	NSX160/250 DC	NSX400/630 DC
Bars	L (mm)	≤ 25	≤ 25	≤ 32
	l (mm)	d + 10	d + 10	d + 15
	d (mm)	≤ 10	≤ 10	≤ 15
	e (mm)	≤ 6	≤ 6	3 ≤ e ≤ 10
	Ø (mm)	6.5	8.5	10.5
Lugs	L (mm)	≤ 25	≤ 25	≤ 32
	Ø (mm)	6.5	8.5	10.5
Torque (Nm) (1)		10	15	50
Torque (Nm) (2)		5/5	5/5	20/11
Torque (Nm) (3)		8	8	20

(1) Tightening torque on the circuit breaker for lugs or bars.
(2) Tightening torque on fixed devices for rear connectors//tightening torque on plug-in or withdrawable devices for power connectors.
(3) Tightening torque on the plug-in base for terminal extensions.

Accessories for NSX100 to 250 DC

Straight terminal extensions

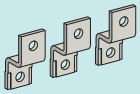
DB112172.eps



Tinned copper

Double-L terminal extensions

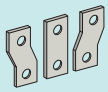
DB112176.eps



Tinned copper

Spreaders: separate parts

DB112177.eps



Tinned copper

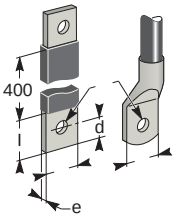
For U > 600 V, the mandatory insulation kit is not compatible with spreaders made up of separate parts.

Connection with accessories to NSX100 to 250 DC (IEC 228)

Pole pitch	
Without spreaders	35 mm
With spreaders	45 mm

Dimensions			With spreaders or terminal extensions	
			NSX100 DC	NSX160/250 DC
Bars	L (mm)		≤ 25	≤ 25
	l (mm)		20 ≤ l ≤ 25	20 ≤ l ≤ 25
	d (mm)		≤ 10	≤ 10
	e (mm)		≤ 6	≤ 6
	Ø (mm)		6.5	8.5
Lugs	L (mm)		≤ 25	≤ 25
	Ø (mm)		6.5	8.5
Torque (Nm) (1)			10	15
Torque (Nm) (2)			5	5

DB115656.eps



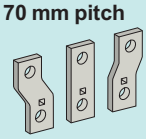
(1) Tightening torque on the circuit breaker for spreaders or terminal extensions.
(2) Tightening torque on the plug-in base for spreaders or terminal extensions.

Spreaders and straight, right-angle, 45°, double-L and edgewise terminal extensions are supplied with flexible interphase barriers.

Accessories for NSX400 and 630 DC

Spreaders made up of separate parts for 52.5 and 70 mm pitch

DB115657.eps



Tinned copper

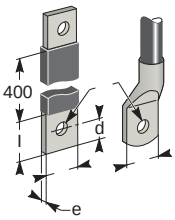
For U > 600 V, use of the 52.5 mm pitch spreaders requires a specific insulation kit.
The 70 mm pitch spreaders may not be used.

Connection with accessories to NSX400 DC and 630 DC (IEC 228)

Pole pitch	
Without spreaders	45 mm
With spreaders	52.5 or 70 mm

Dimensions			With spreaders	With terminal extensions
Bars	L (mm)		≤ 40	≤ 32
	l (mm)		d + 15	30 ≤ l ≤ 34
	d (mm)		≤ 20	≤ 15
	e (mm)		3 ≤ e ≤ 10	3 ≤ e ≤ 10
	Ø (mm)		12.5	10.5
Lugs	L (mm)		≤ 40	≤ 32
	Ø (mm)		12.5	10.5
Torque (Nm) (1)			50	50
Torque (Nm) (2)			20	20

DB115656.eps



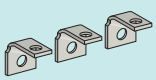
(1) Tightening torque on the circuit breaker for spreaders or terminal extensions.
(2) Tightening torque on the plug-in base for spreaders or terminal extensions.

Spreaders and right-angle, 45° and edgewise terminal extensions are supplied with flexible interphase barriers.

Accessories for NSX100 to 630 DC

Right-angle terminal extensions

DB112173.eps



Tinned copper
To be mounted on upstream side.

Edgewise terminal extensions

DB112175.eps



Tinned copper

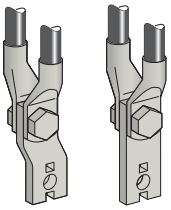
45° terminal extensions

DB112174.eps



Tinned copper

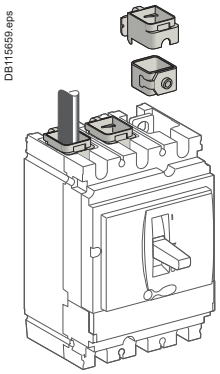
DB115658.eps

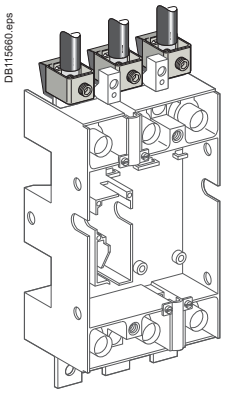


Mounting detail: 2 cables with lugs.

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Connection of bare cables to Compact NSX100 to 630 DC

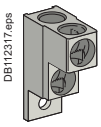




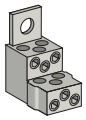
Connection for NSX100 to 250 DC



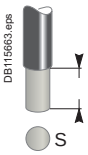
1-cable connector



2-cable connector



Distribution connector



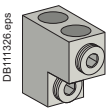
	1-cable connector	Steel ≤ 160 A	Aluminium ≤ 250 A		
	L (mm)	25	25		
	S (mm²) Cu / Al	1.5 to 95 (1)	25 to 50	70 to 95	120 to 185 150 max. flex.
	Torque (Nm)	12	20	26	26
	2-cable connector				
	L (mm)	25 or 50			
	S (mm²) Cu / Al	2 x 50 to 2 x 120			
	Torque (Nm)	22			
	6-cable distribution connector (copper or aluminium)				
	L (mm)	15 or 30			
	S (mm²) Cu / Al	1.5 to 6 (1)	8 to 35		
	Torque (Nm)	4	6		

(1) For flexible cables from 1.5 to 4 mm², connection with crimped or self-crimping ferrules.

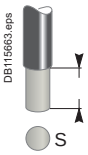
Connection to NSX400 and 630 DC



1-cable connector



2-cable connector



	1-cable connector	2-cable connector
L (mm)	30	30 or 60
S (mm²) Cu / Al	35 to 300 rigid 240 max. flex.	2 x 35 to 2 x 240 rigid 240 max. flex.
Torque (Nm)	31	31

Conductor materials and electrodynamic stresses

Compact NSX DC circuit breakers can be connected indifferently with bare-copper, tinned-copper and tinned-aluminium conductors (flexible or rigid bars, cables).
In the event of a short-circuit, thermal and electrodynamic stresses will be exerted on the conductors. They must therefore be correctly sized and held in place by supports.
Electrical connection points on switchgear devices (switch-disconnectors, contactors, circuit breakers, etc.) should not be used for mechanical support.
Any partition between upstream and downstream connections of the device must be made of non-magnetic material.

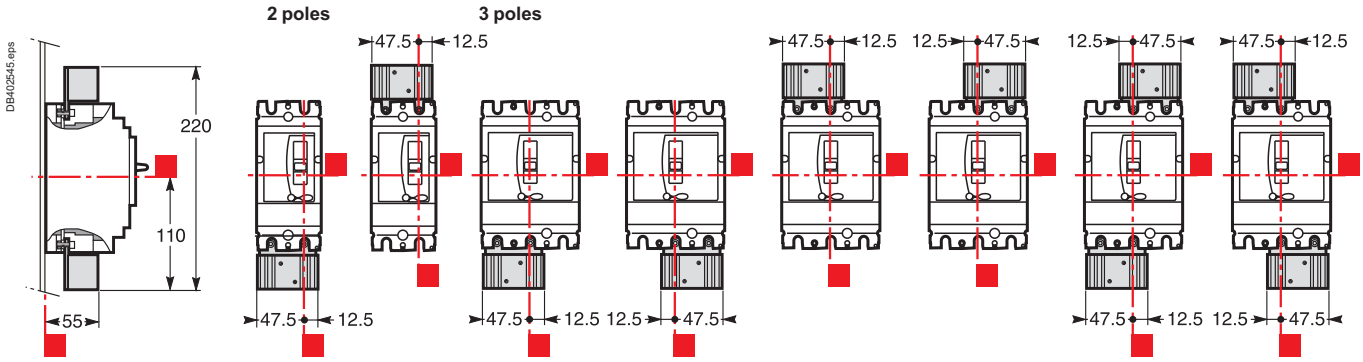
For reference only. www.fengshengelectric.com.sg

Compact (fixed version) 2P-3P-4P Parallel and series connection of poles

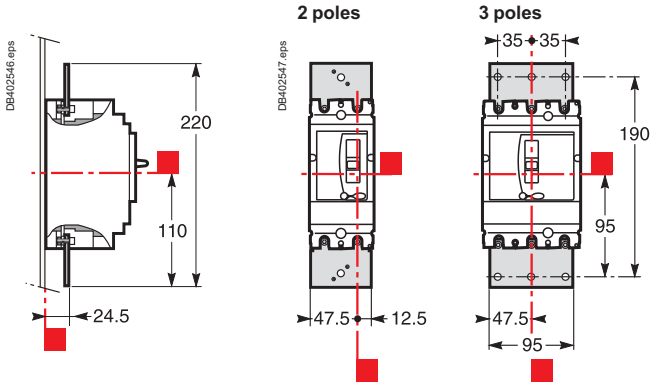
Compact NSX100 to NSX250 DC

2P fixed version (Compact NSX100-160 N/H DC) - 3P fixed version (Compact NSX100-250 DC)

With series connections

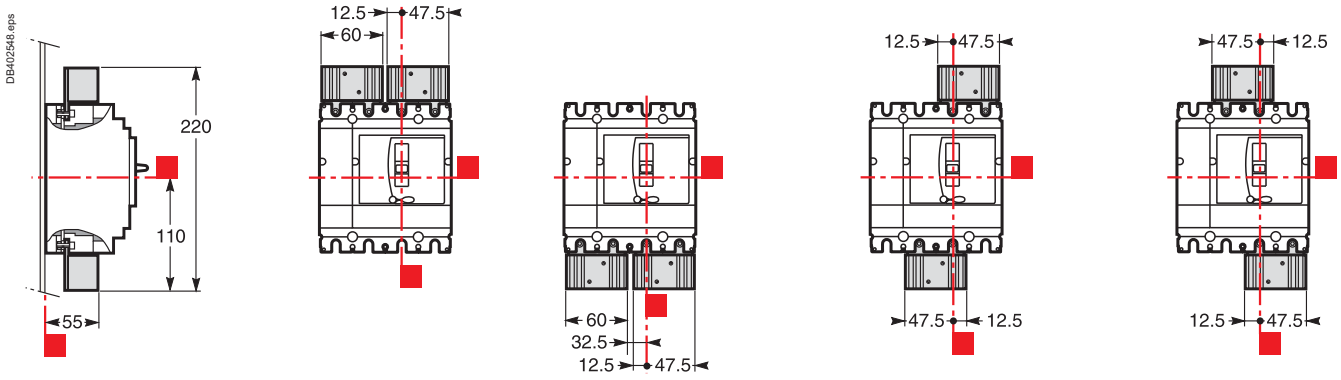


With parallel connections

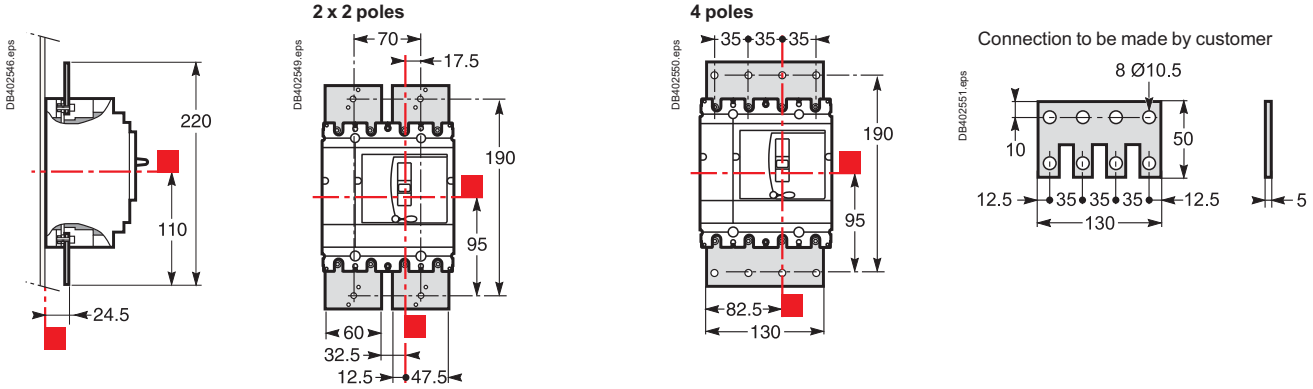


4P fixed version (Compact NSX100-250 DC)

With series connections



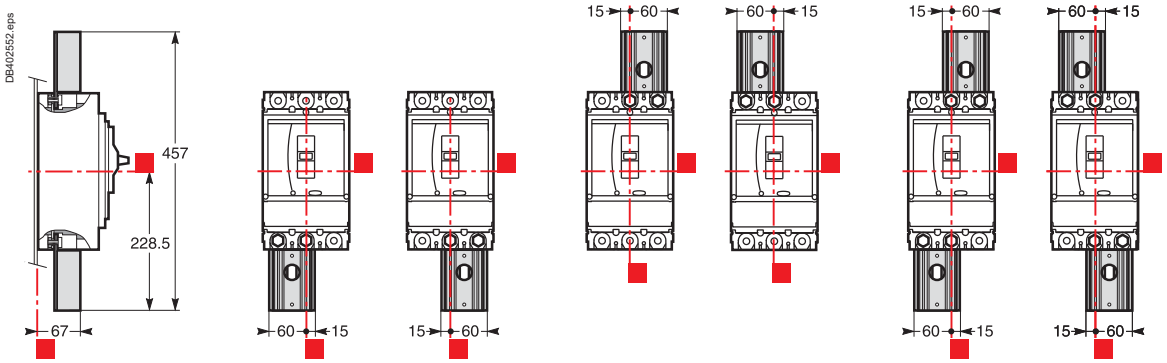
With parallel connections



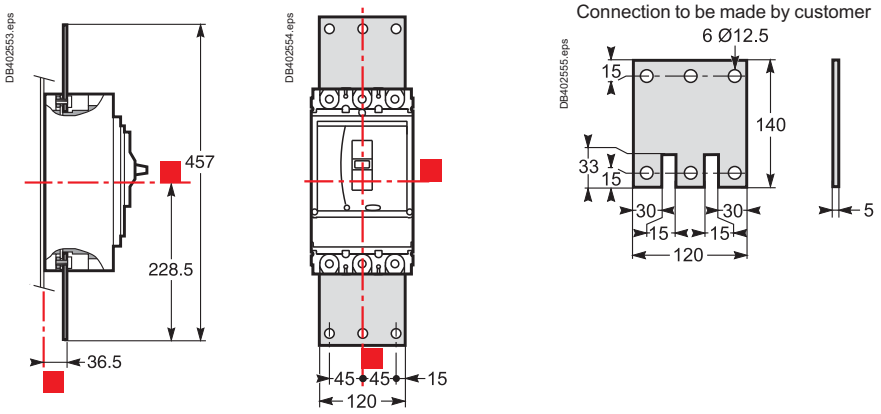
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3P fixed version (Compact NSX400-630 DC)

With series connections

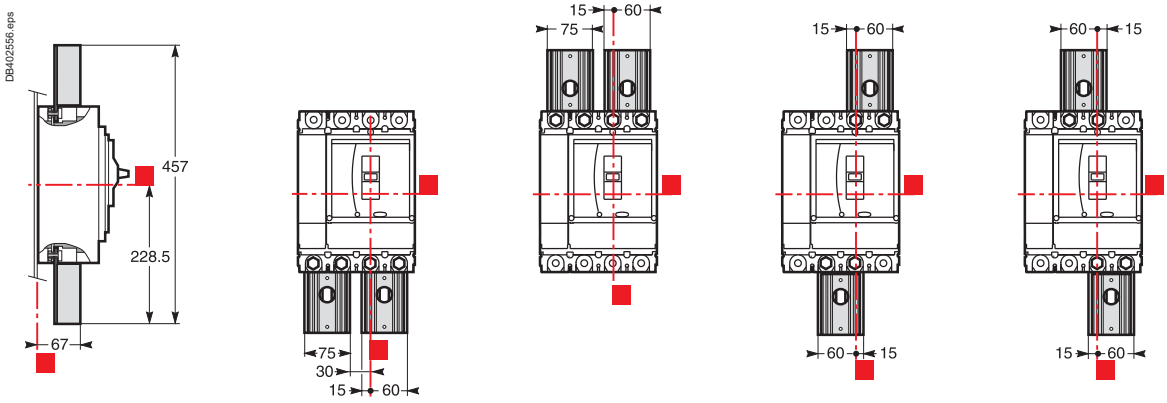


With parallel connections

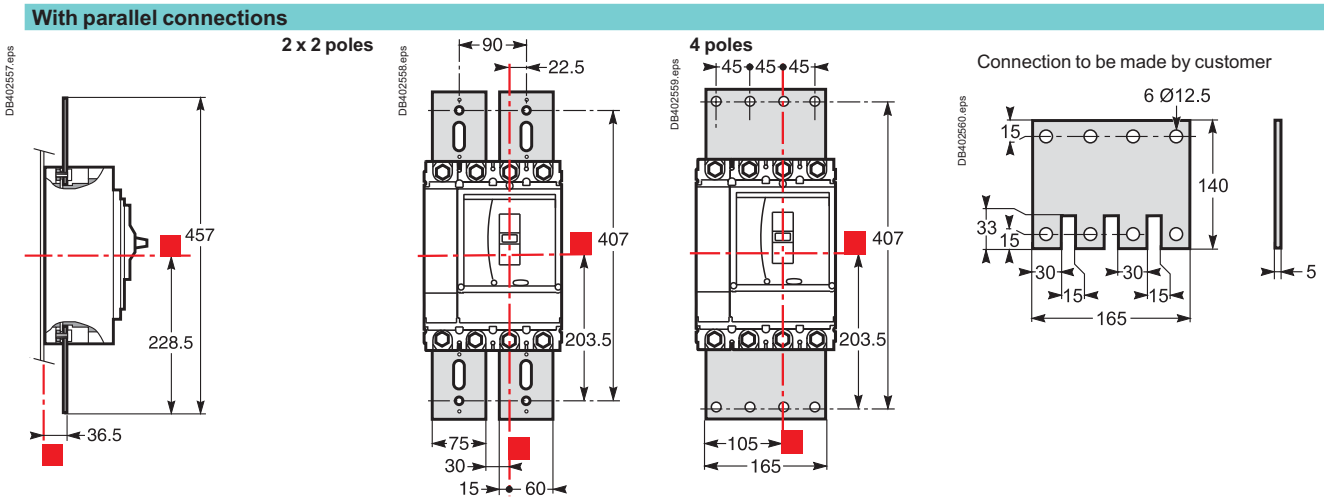


4P fixed version (Compact NSX100 to NSX630 DC)

With series connections



With parallel connections



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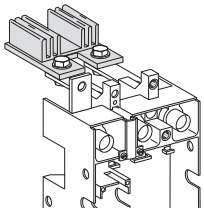
Compact (withdraw. version) 3P-4P Parallel and series connection of poles

Compact NSX100 to NSX250 DC

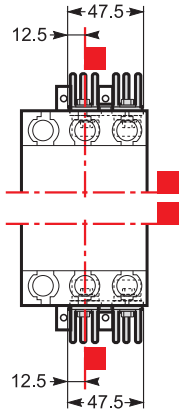
3P withdrawable version

Connections mounted with heat sink directed outwards

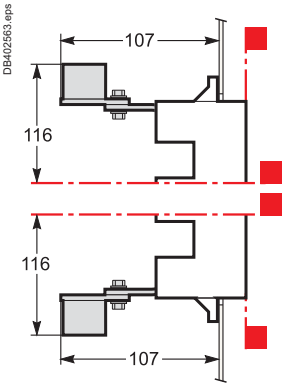
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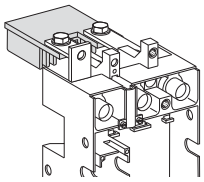


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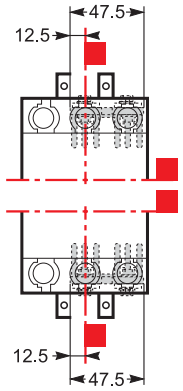


Connections mounted with heat sink directed inwards

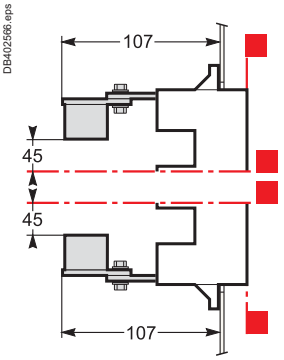
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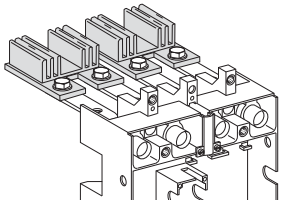
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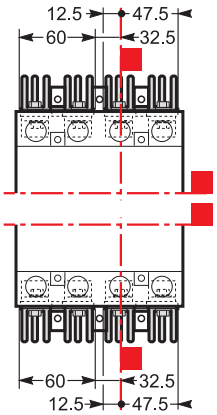
4P withdrawable version

Connections mounted with heat sink directed outwards

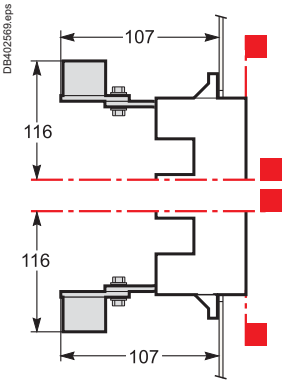
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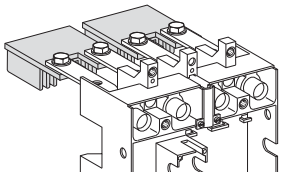


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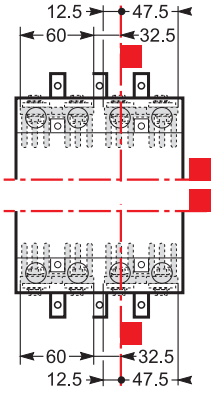


Connections mounted with heat sink directed inwards

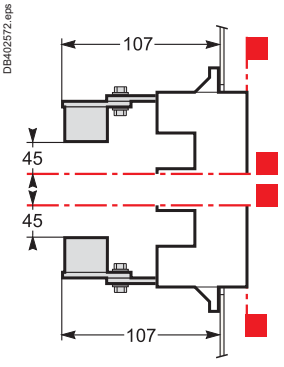
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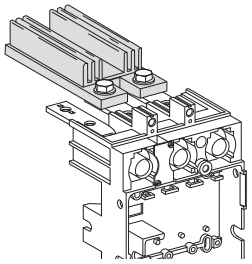


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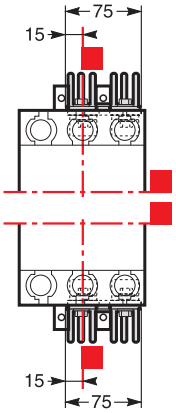
3P withdrawable version

Connections mounted with heat sink directed outwards

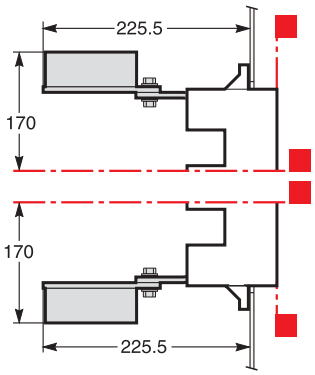
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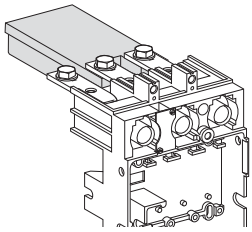


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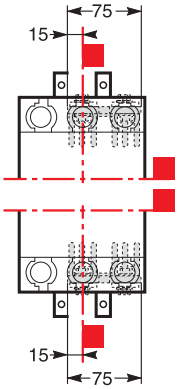


Connections mounted with heat sink directed inwards

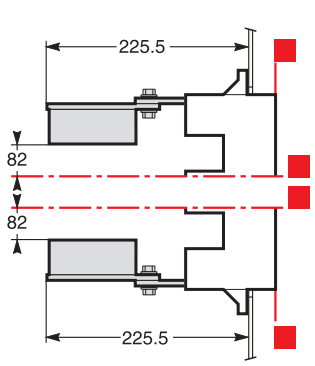
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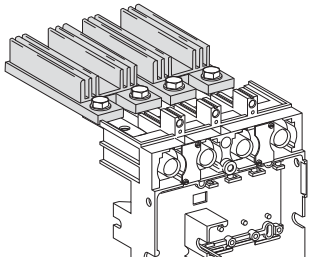
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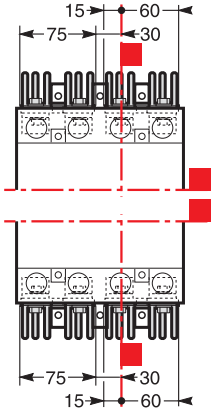
4P withdrawable version

Connections mounted with heat sink directed outwards

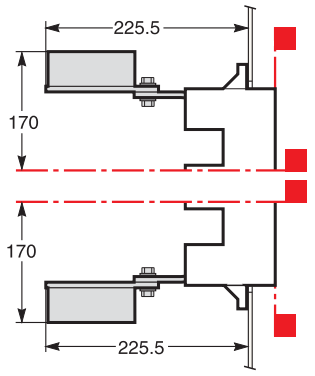
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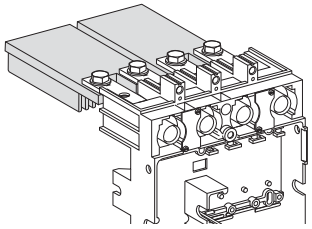


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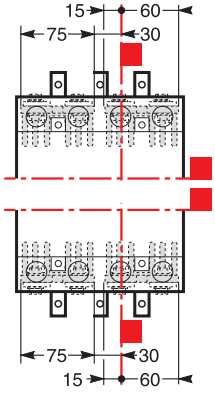


Connections mounted with heat sink directed inwards

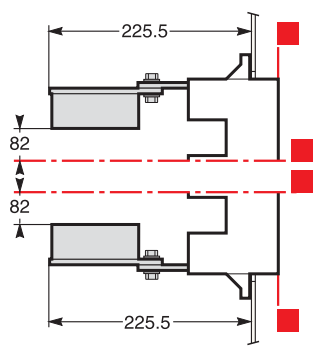
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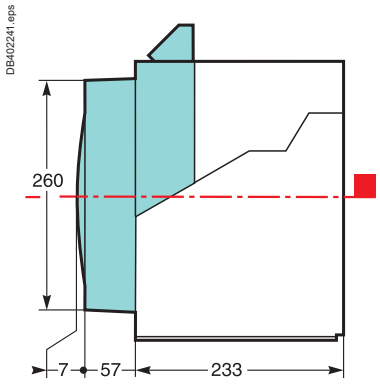
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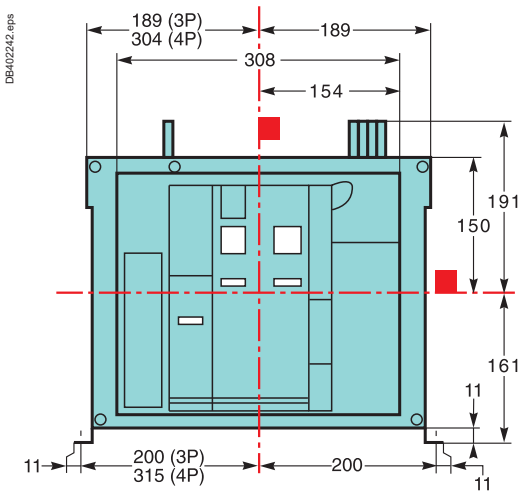


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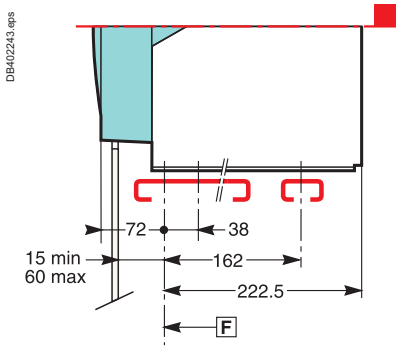
Masterpact NW10 to 40 DC
Fixed device
Version C/D (3 poles)
Version E (4 poles)

Device

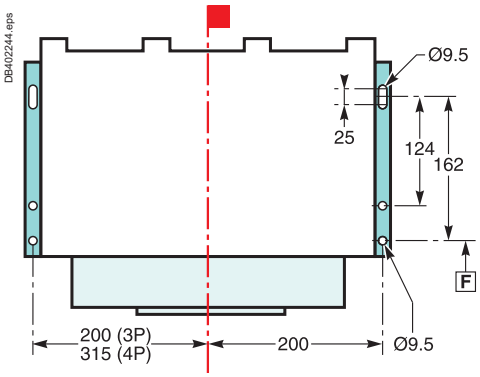




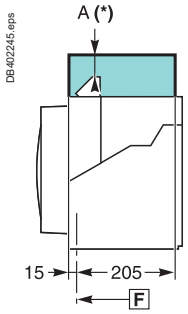
Mounting on base plate or rails

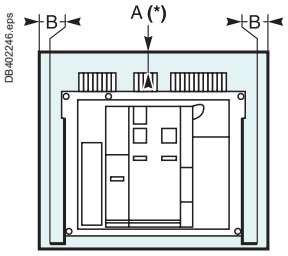


Mounting detail

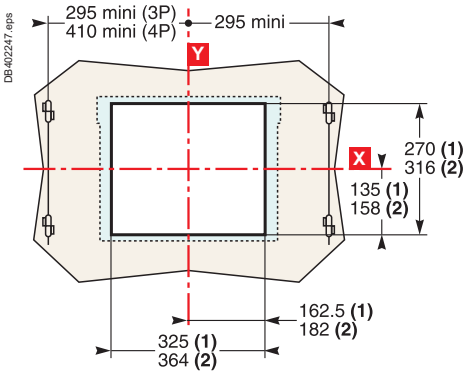


Safety clearances





Door cutout



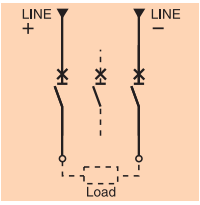
	Insulated parts	Metal parts	Energised parts
A	0	0	100
B	0	0	60

F: *Datum.*

Note:
(1) Without escutcheon.
(2) With escutcheon.
X and Y are the symmetry planes for a 3-pole device.
A(*) An overhead clearance of 110 mm is required to remove the arc chutes.
An overhead clearance of 20 mm is required to remove the terminal block.

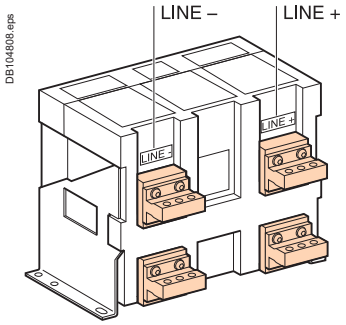
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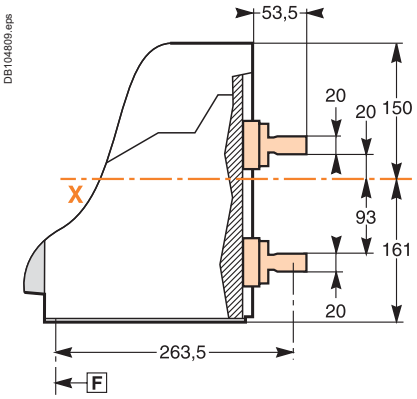
Fixed device
Version C



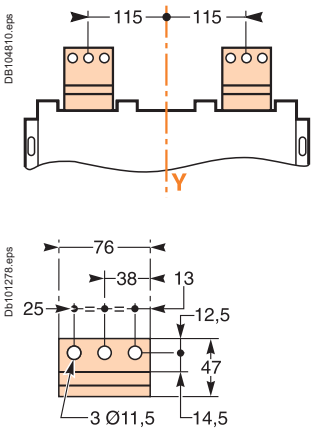
Connections

Horizontal rear connection (NW10 - NW20 DC)

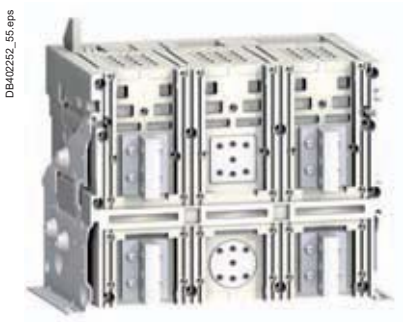


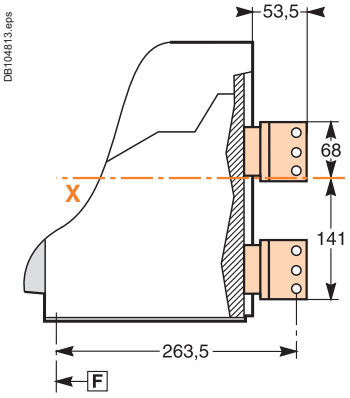


Detail

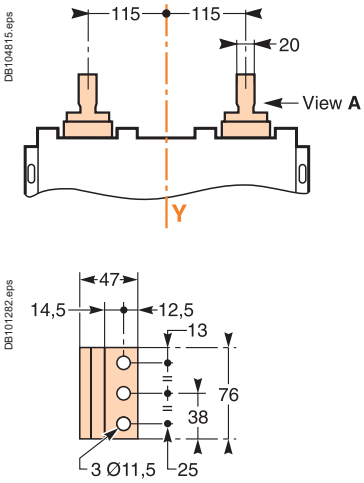


Vertical rear connection (NW10 - NW20 DC)



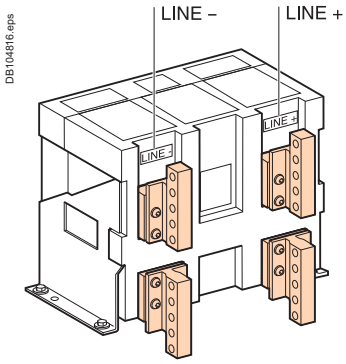


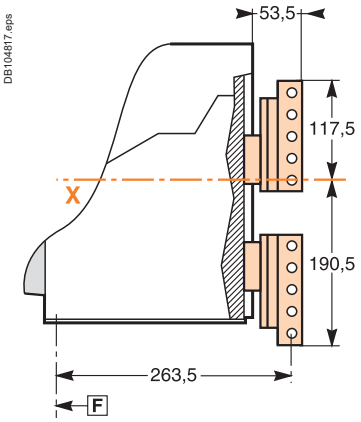
Detail



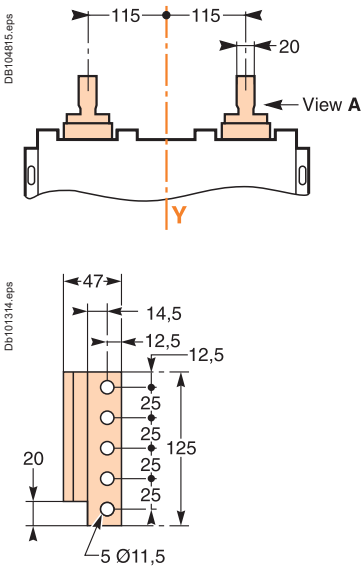
View A detail.

Vertical rear connection (NW40 DC)





Detail

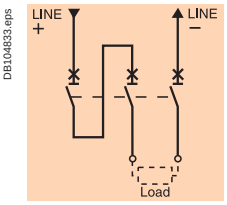


View A detail.

Note:
Recommended connection screws: ***M10*** *class 8.8.*
Tightening torque: ***50 Nm*** *with contact washer.*

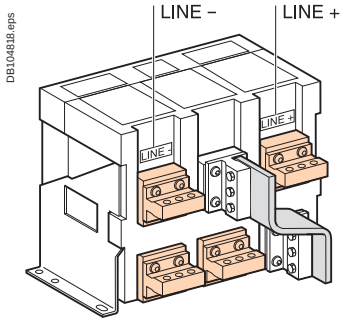
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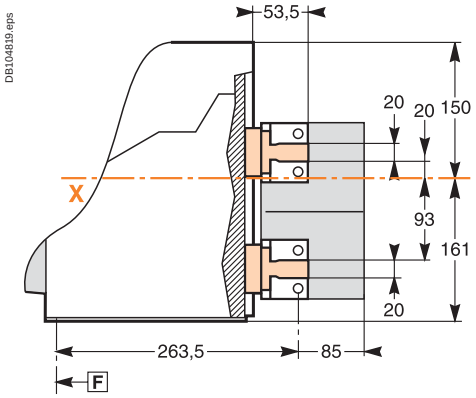
Masterpact
NW10 to 40 DC
Fixed device
Version D



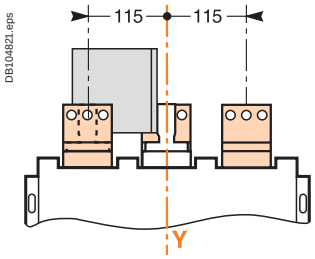
Connections

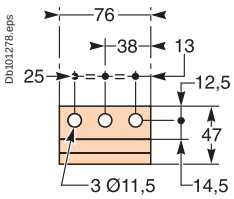
ori ontal rear connection N - N DC





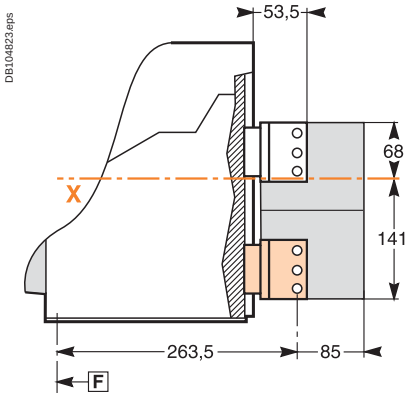
Detail



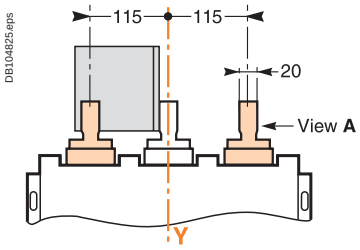


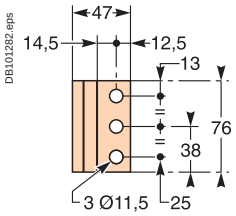
ertical rear connection N - N DC





Detail

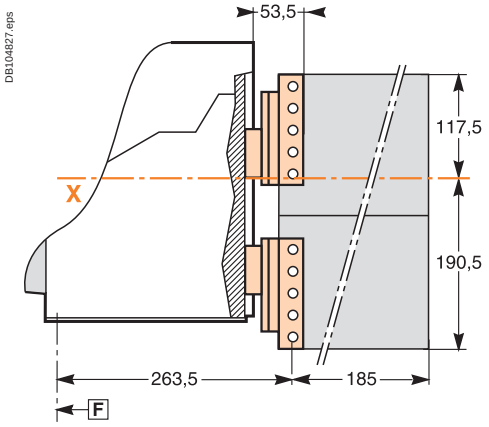




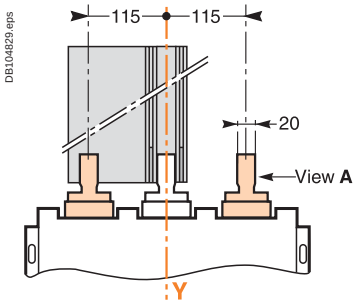
ie etail

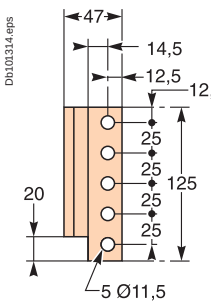
ertical rear connection N DC





Detail



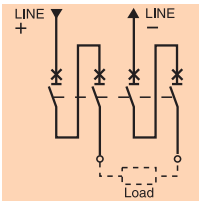


ie etail

Note:
ecommen e connection scre s ***M10*** *class*
i tenin tor ue ***50 Nm*** *it contact as er*

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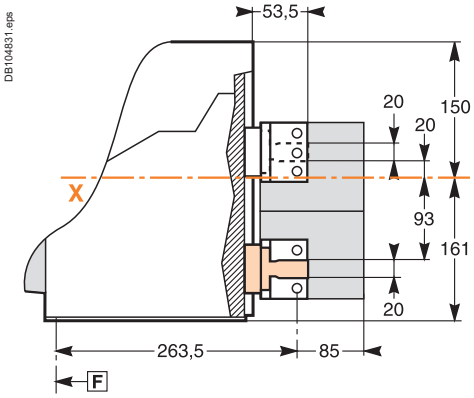
Fixed device
Version E



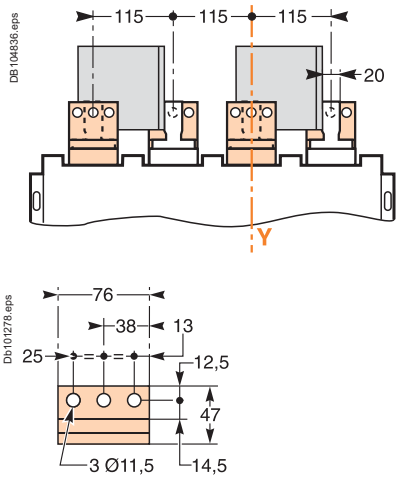
Connections

Horizontal rear connection (NW10 - NW20 DC)



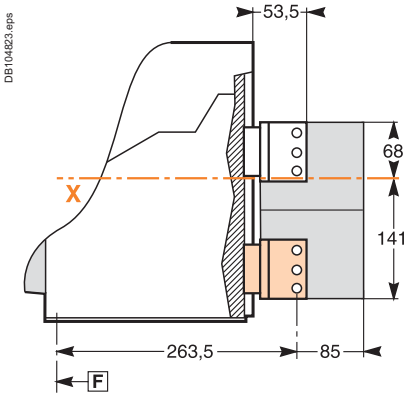


Detail

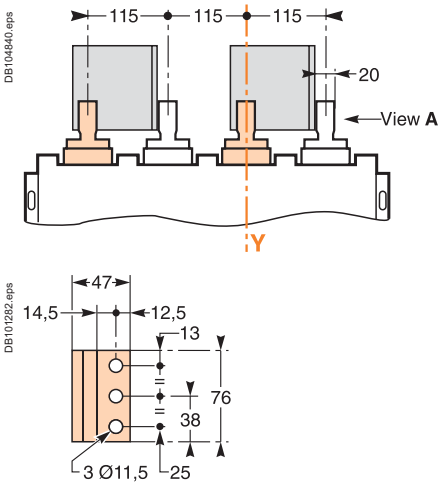


Vertical rear connection (NW10 - NW20 DC)





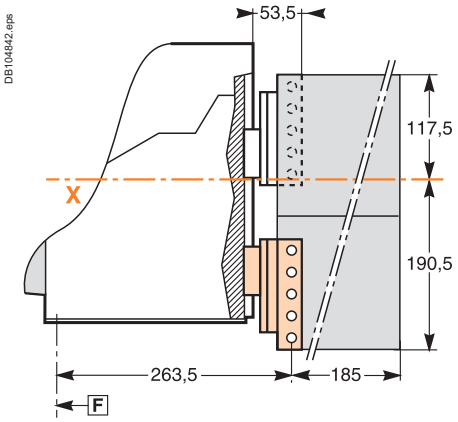
Detail



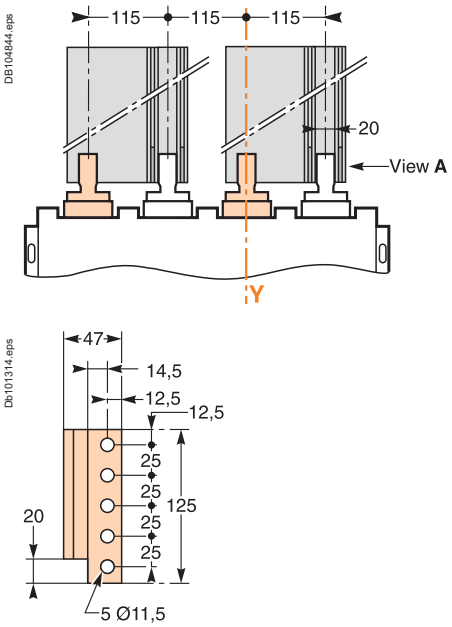
View A detail.

Vertical rear connection (NW40 DC)





Detail



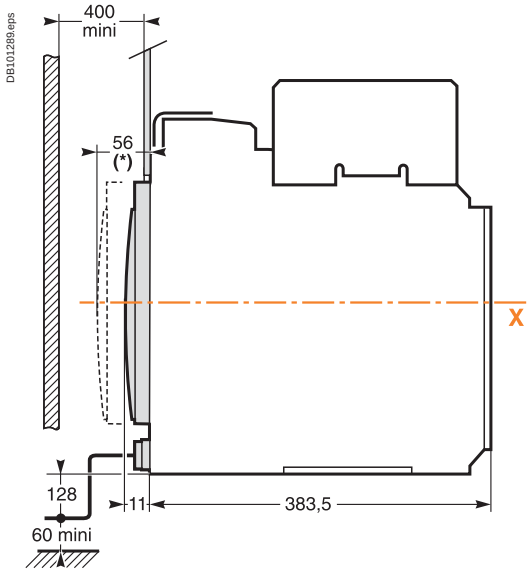
View A detail.

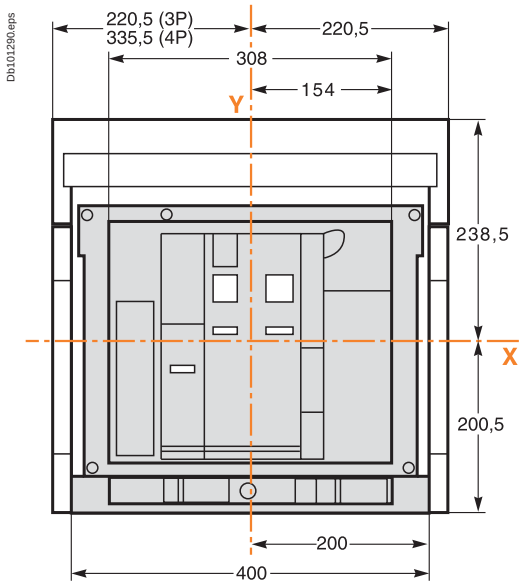
Note:
*Recommended connection screws: **M10** class 8.8.*
*Tightening torque: **50 Nm** with contact washer.*

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Masterpact NW10 to 40 DC
Drawout device
Version C/D (3 poles)
Version E (4 poles)

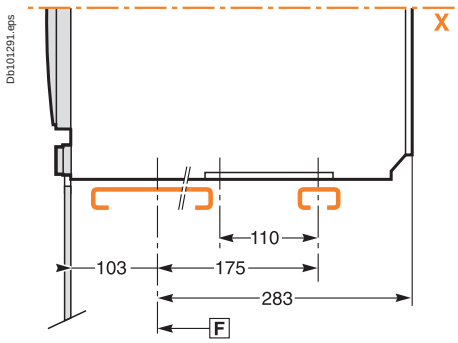
Device



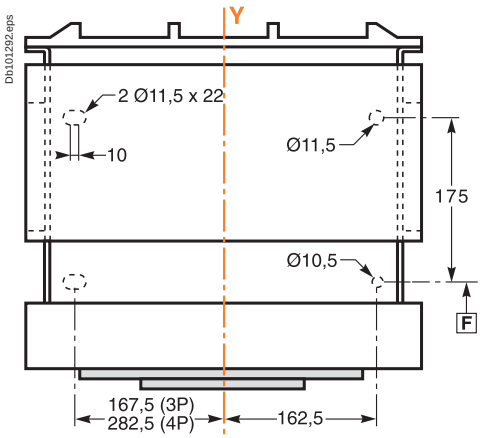


(*) ra out position

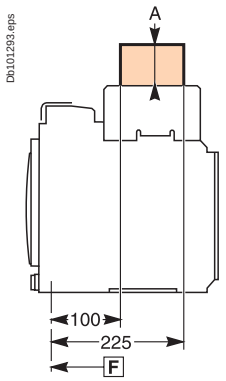
ountin on ase plate or rails

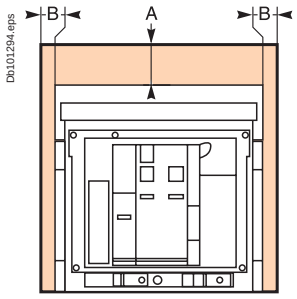


ountin detail



Safet clearances

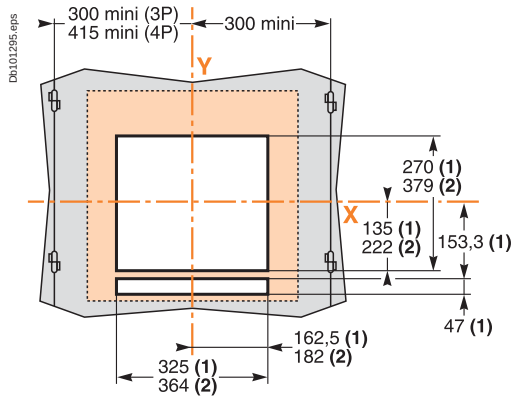




	nsulated parts	etal parts	Ener ised parts
	0	0	0
	0	0	60

F atum

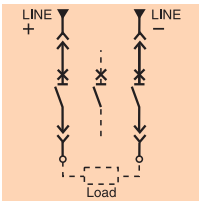
Door cutout



Note:
(1) it out escutc eon
(2) it escutc eon
X an Y are t e symmetry planes for a pole e ice

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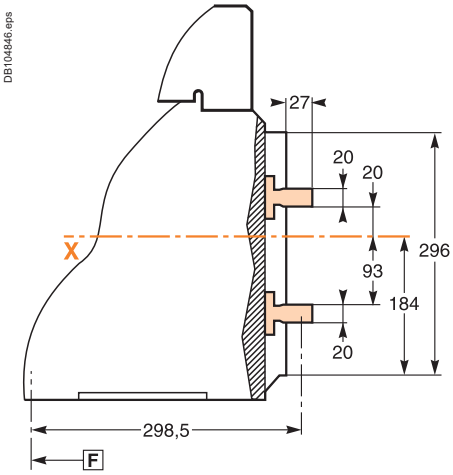
Drawout device
Version C



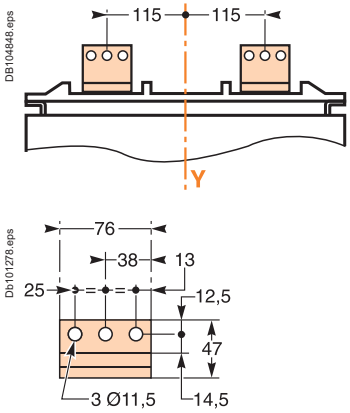
Connections

Horizontal rear connection (NW10 - NW20 DC)



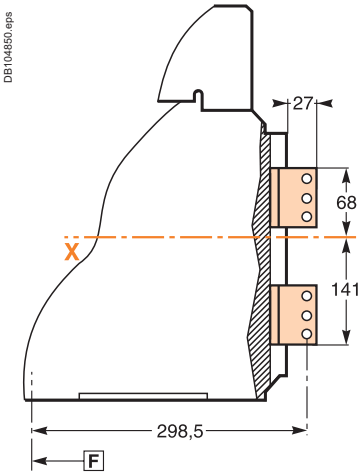


Detail

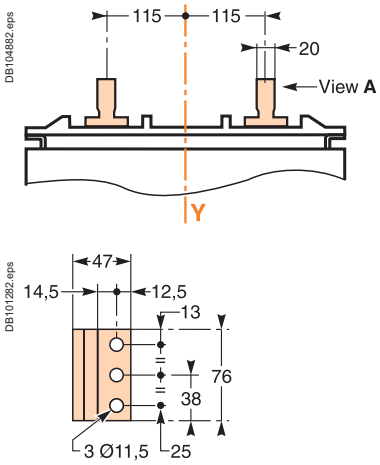


Vertical rear connection (NW10 - NW20 DC)



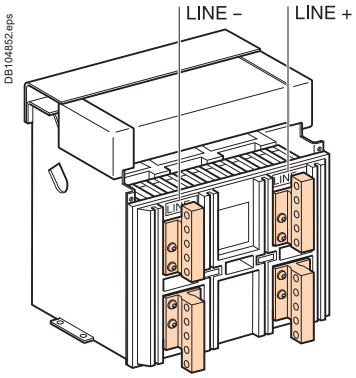


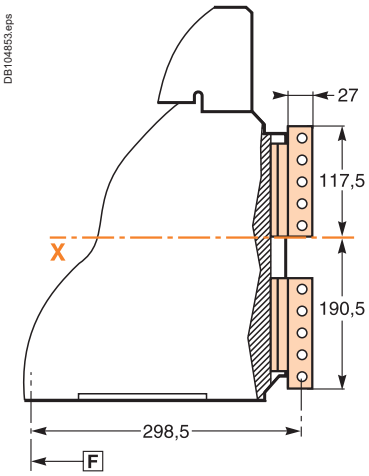
Detail



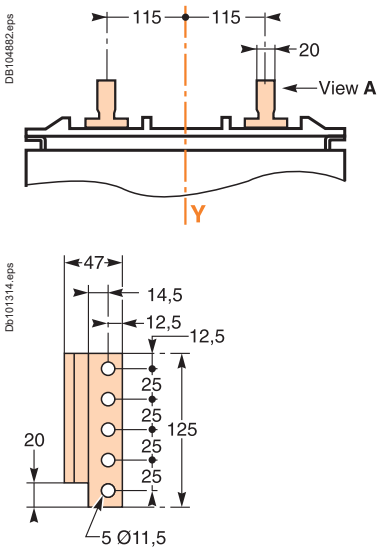
View A detail.

Vertical rear connection (NW40 DC)





Detail



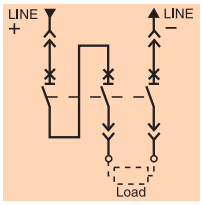
View A detail.

Note:
Recommended connection screws: ***M10*** *class 8.8.*
Tightening torque: ***50 Nm*** *with contact washer.*

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Masterpact NW10 to 40 DC

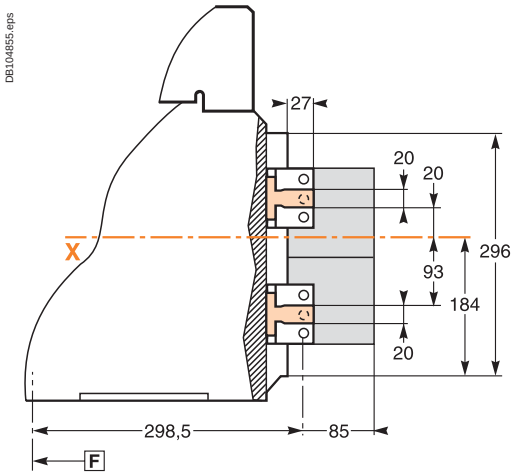
Drawout device
Version D



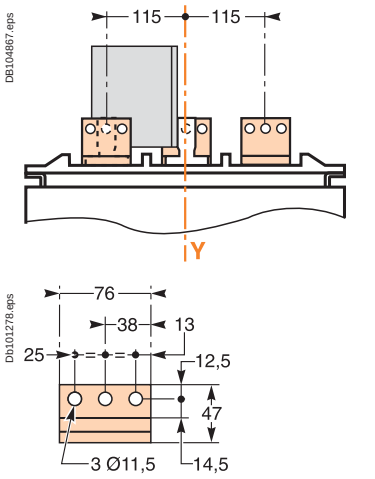
Connections

ori ontal rear connection N - N DC

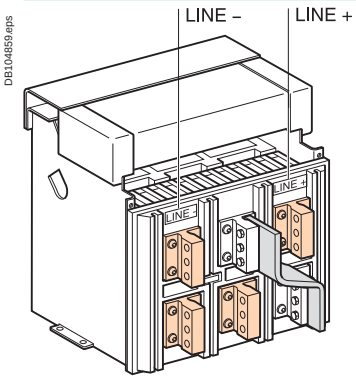


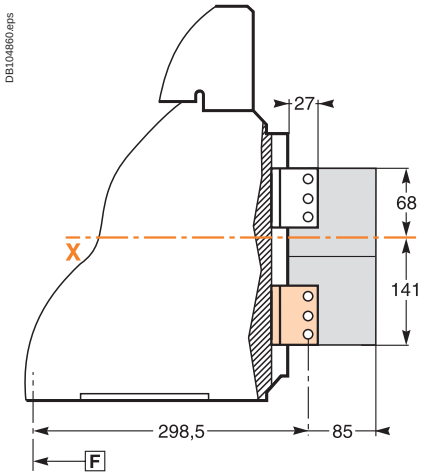


Detail

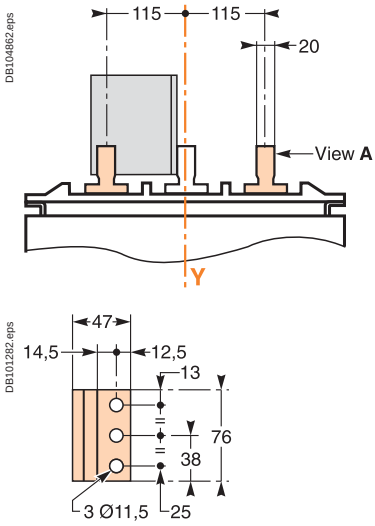


ertical rear connection N - N DC





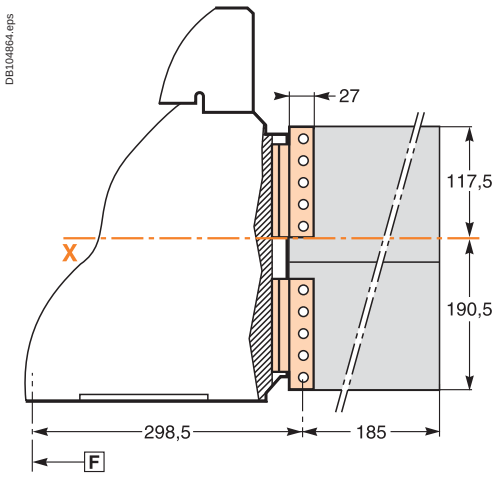
Detail



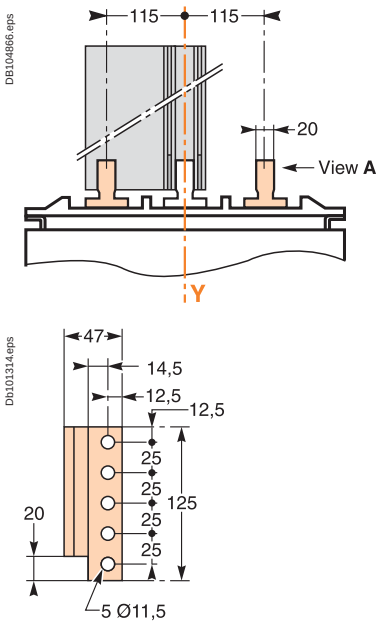
ie etail

ertical rear connection N DC





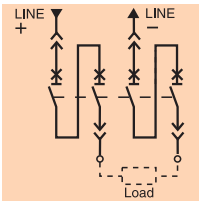
Detail



ie etail

Note:
ecommen e connection scre s ***M10*** *class*
i tenin tor ue ***50 Nm*** *it contact as er*

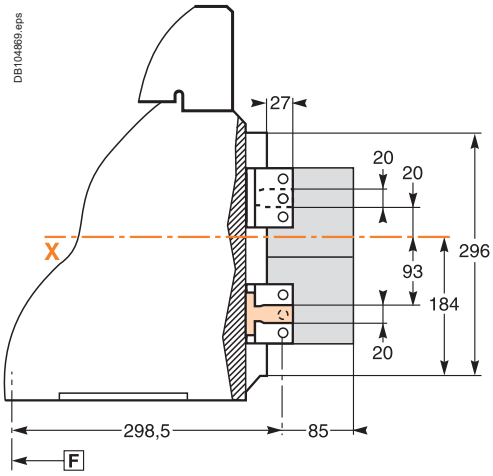
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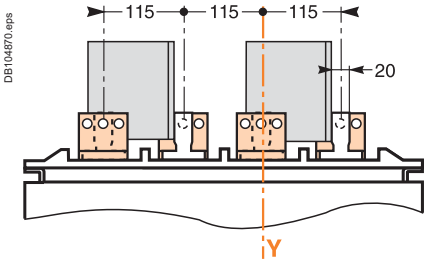
Connections

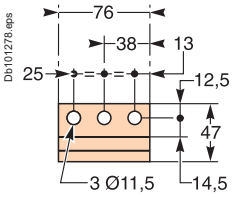
Horizontal rear connection (NW10 - NW20 DC)



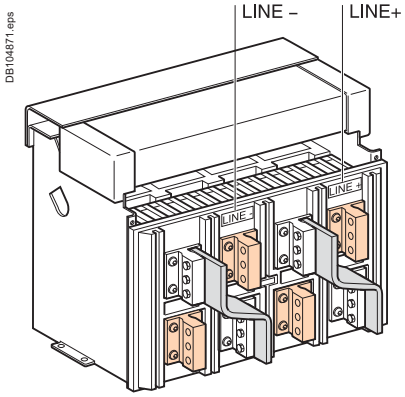


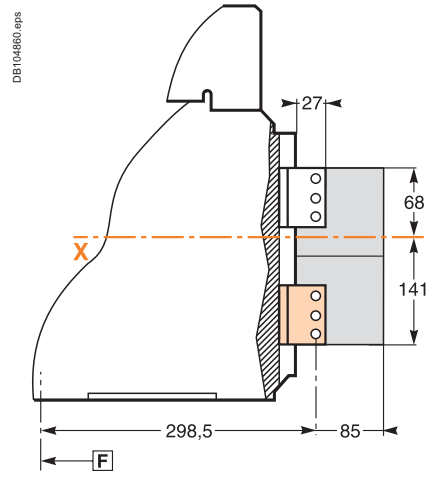
Detail



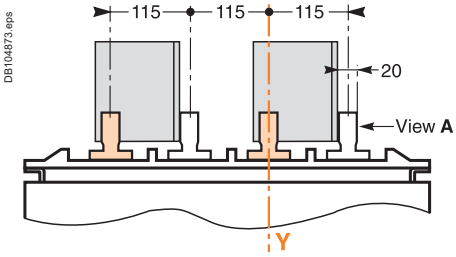


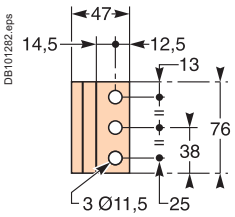
Vertical rear connection (NW10 - NW20 DC)





Detail

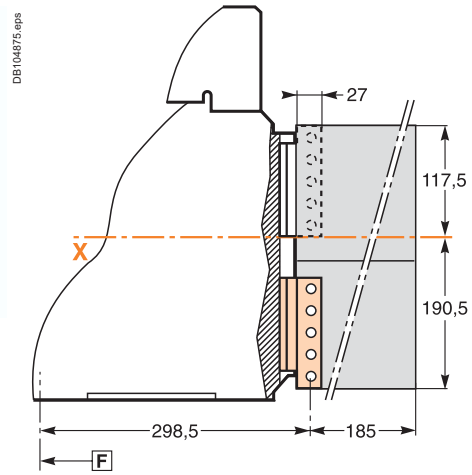




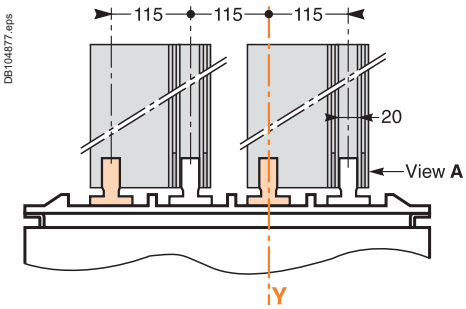
View A detail.

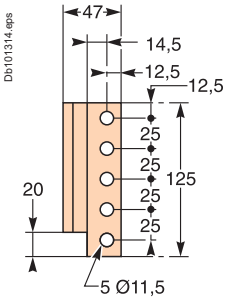
Vertical rear connection (NW40 DC)





Detail





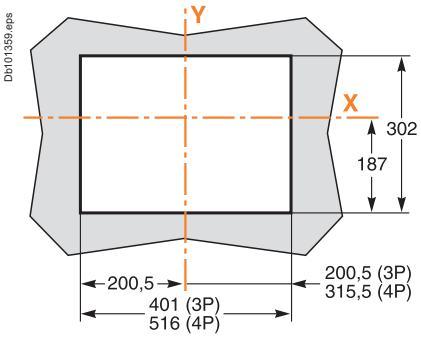
View A detail.

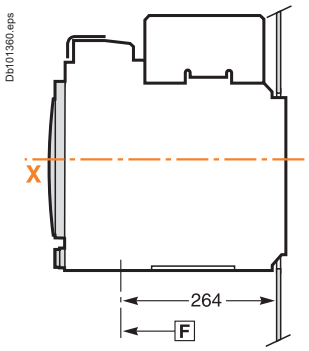
Note:
*Recommended connection screws: **M10** class 8.8.*
*Tightening torque: **50 Nm** with contact washer.*

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Masterpact NW10 to 40 DC
Accessories

Rear panel cutout (drawout device)
NW10 to NW40 DC

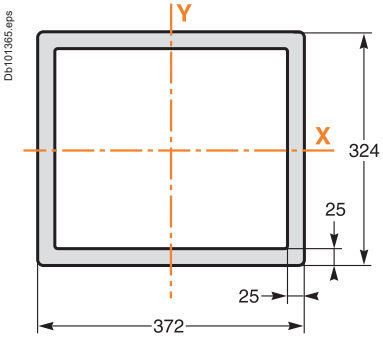




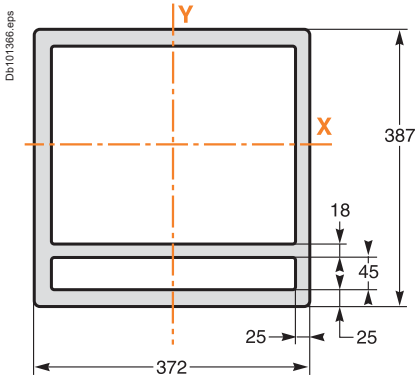
F : *Datum.*

Escutcheon

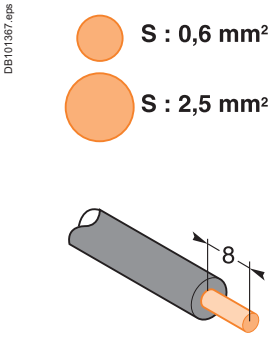
Fixed device

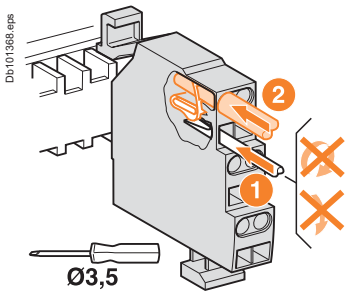


Drawout device



Connection of auxiliary wiring to terminal block

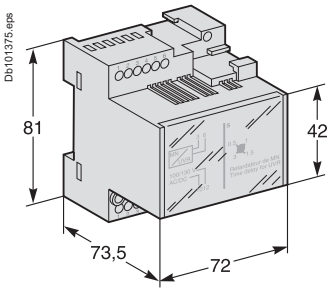


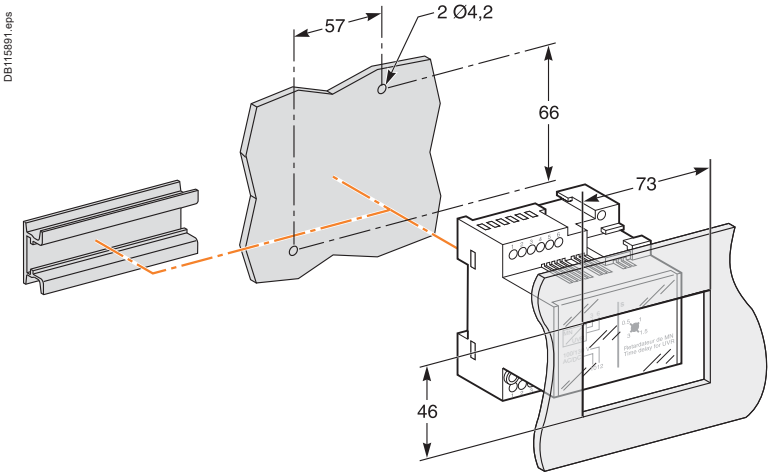


One conductor only per connection point.

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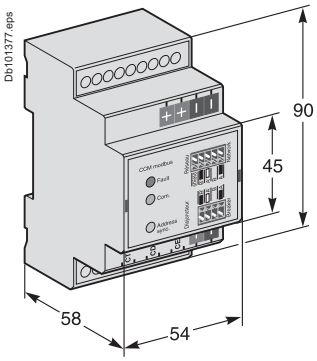
Delay unit for MN release





"Chassis" communication module

Modbus



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TOOLS

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- comprehensive descriptions
- range data sheets
- a download area
- product selectors
- ...

You can also access the information dedicated to your business and get in touch with your Schneider Electric country support.



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Electrical diagrams

Presentation 2
Functions and characteristics A-1
Installation recommendations B-1
Dimensions and connection C-1

Compact NSX100 to 630 DC
Fixed circuit breakers D-2
Plug-in / withdrawable circuit breakers D-4
Motor mechanism D-6

Masterpact NW10 to NW40 DC
Fixed and drawout devices D-8

Masterpact NW DC
Communication D-10

Fixed, electrically operated Masterpact NW DC
Wiring of the COM option (with BCM ULP) and external power supply D-12

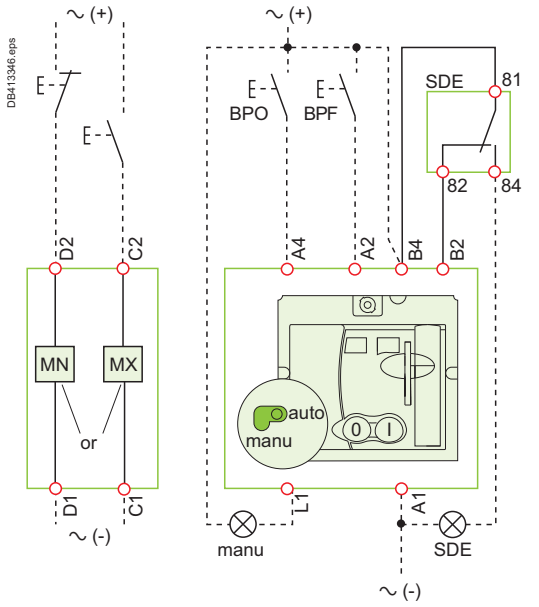
Withdrawable Masterpact NT DC and NW DC
Wiring of the COM option (with CCM) and external power supply D-13

Additional characteristics E-1
Catalogue numbers and order form F-1

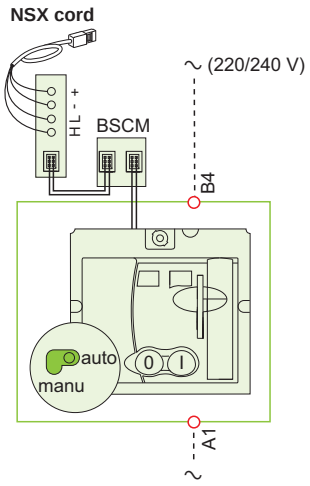
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Compact NSX100 to 630 DC
Fixed circuit breakers

Remote operation



otor mechanism T



Communicatin motor mechanism Tc

(1) NSX100-250 DC only.

Remote operation

MN: undervoltage release
or
MX: shunt release

Motor mechanism (MT)

A4: opening order
A2: closing order
B4, A1: power supply to motor mechanism
L1: manual position (manu)
B2: SDE interlocking (mandatory for correct operation)

BPO: opening pushbutton
BPF: closing pushbutton

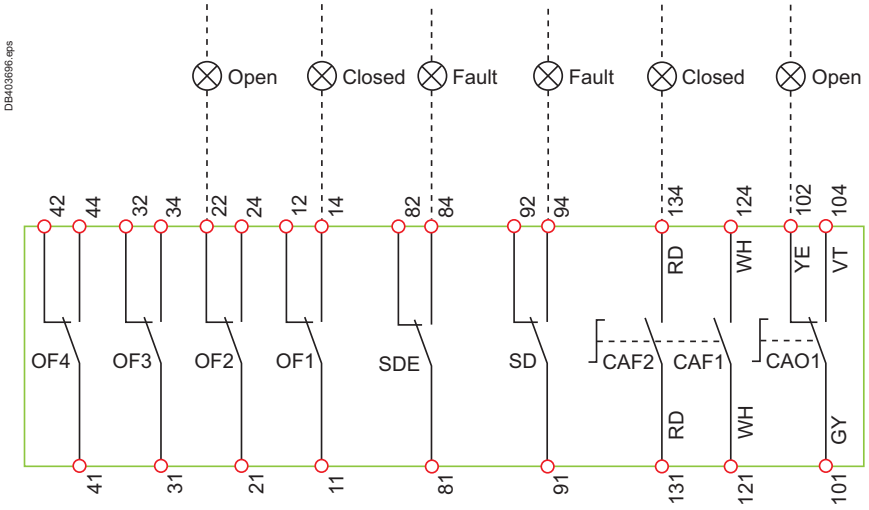
Communicating motor mechanism (MTc) (1)

B4, A1: motor mechanism power supply
BSCM: breaker status and control module

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Compact NSX100 to 630 DC
Fixed circuit breakers

Indication contacts



The diagram is shown with circuits de-energised, all devices open, connected and charged and relays in normal position.

Terminals shown in red **O** *must be connected by the customer.*

Indication contacts

OF2 / OF1:	device ON/OFF indication contacts
OF4 / OF3:	device ON/OFF indication contacts (NSX400/630)
SDE:	fault-trip indication contact (short-circuit, overload, ground fault, earth leakage)
SD:	trip-indication contact
CAF2/CAF1:	early-make contact (rotary handle only)
CAO1:	early-break contact (rotary handle only)

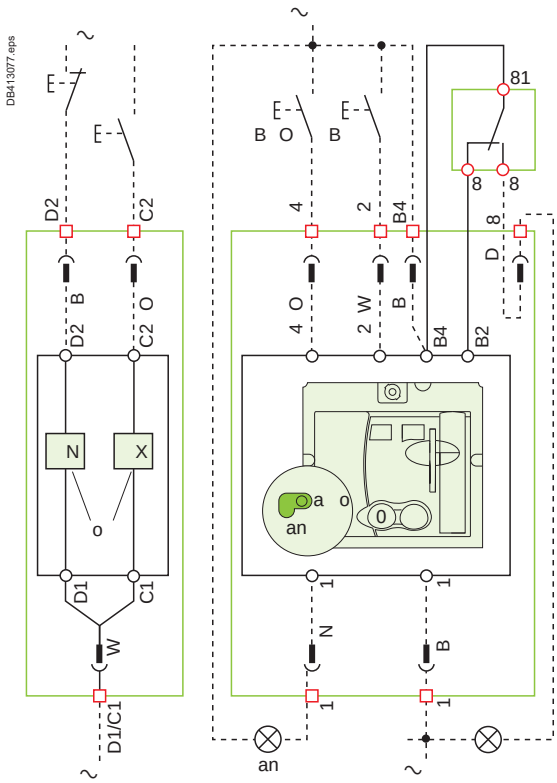
Colour code for auxiliary wiring

RD:	red	**VT:**	violet
WH:	white	**GY:**	grey
YE:	yellow	**OR:**	orange
BK:	black	**BL:**	blue
GN:	green		

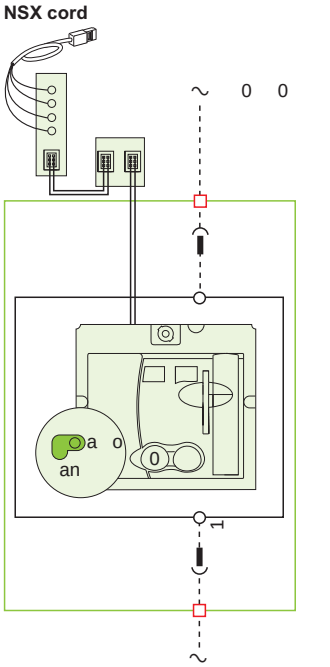
For reference only. www.fengshengelectric.com.sg

Compact NSX100 to 630 DC
Plug-in / withdrawable circuit breakers

Remote operation



Motor mechanism (MT)



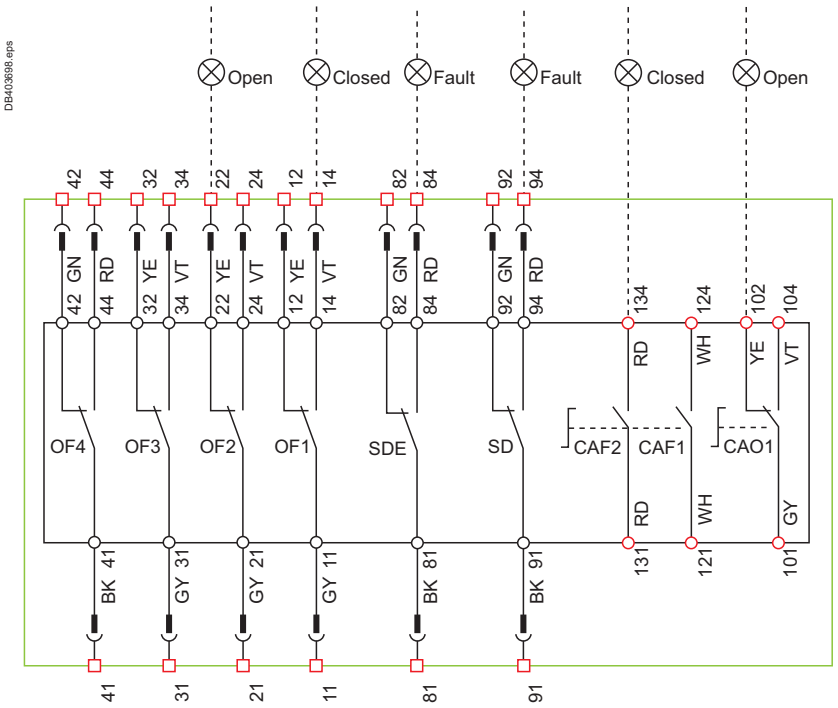
Communicating motor mechanism (MTc) (1)

(1) NSX100-250 DC only.

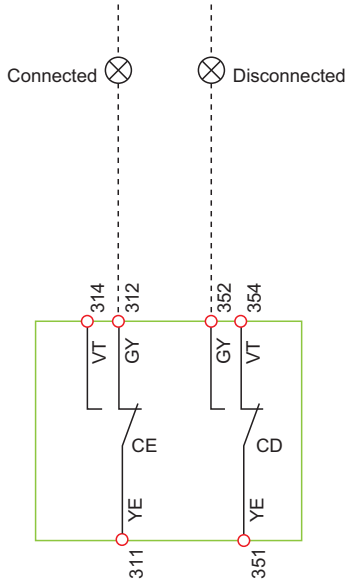
For reference only. www.fengshengelectric.com.sg

Compact NSX100 to 630 DC
Plug-in / withdrawable circuit breakers

Indication contacts



Carriage switches



Remote operation

MN: undervoltage release
or
MX: shunt release

Motor mechanism (MT)

A4: opening order
A2: closing order
B4, A1: motor mechanism power supply
L1: manual position (manu)
B2: SDE interlocking (mandatory for automatic or remote recharging)
BPO: opening pushbutton
BPF: closing pushbutton

Communicating motor mechanism (MTc)

B4, A1: motor mechanism power supply
BSCM: breaker status and control module

Indication contacts

OF2 / OF1: device ON/OFF indication contacts
OF4 / OF3: device ON/OFF indication contacts (NSX400/630)
SDE: fault-trip indication contact (short-circuit, overload, ground fault, earth leakage)
SD: trip-indication contact
CAF2/CAF1: early-make contact (rotary handle only)
CAO1: early-break contact (rotary handle only)

For reference only. www.fengshengelectric.com.sg

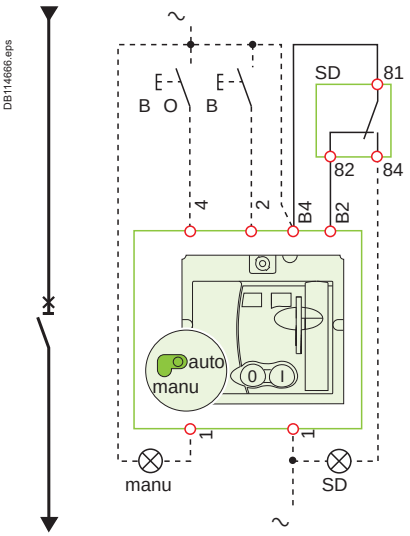
Compact NSX100 to 630 DC
Motor mechanism

The diagram is shown with circuits de-energised, all devices open, connected and charged and relays in normal position.

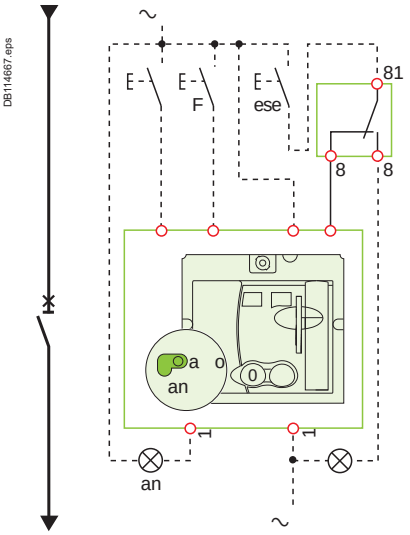
After tripping initiated by the "Push to trip" button or by the undervoltage (MN) release or the shunt (MX) release, device reset can be automatic, remote or manual.

Following tripping due to an electrical fault (with an SDE contact), reset must be carried out manually.

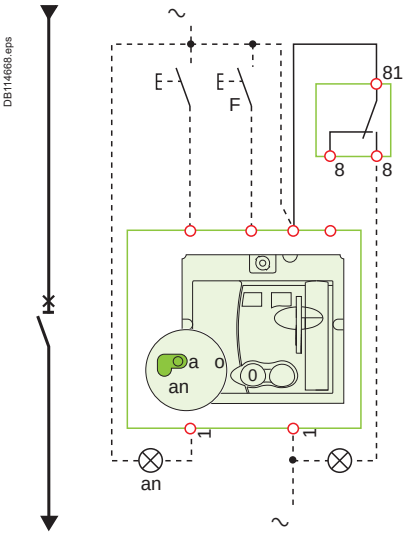
Motor mechanism (MT) with automatic reset



Motor mechanism (MT) with remote reset



Motor mechanism (MT) with manual reset



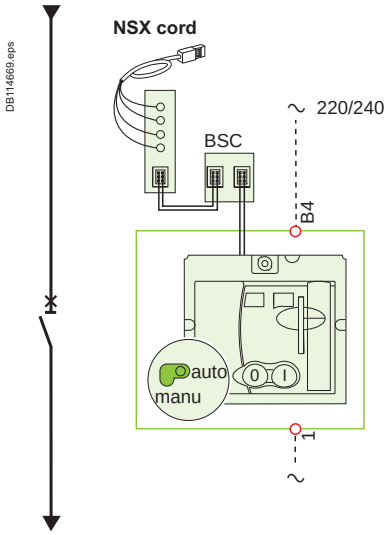
Symbols

Q:	circuit breaker
A4 :	opening order
A2:	closing order
B4, A1:	motor mechanism power supply
L1:	manual position (manu)
B2:	SDE interlocking (mandatory for correct operation)
BPO:	opening pushbutton
BPF:	closing pushbutton
SDE:	fault-trip indication contact (short-circuit, overload, ground fault, earth leakage)

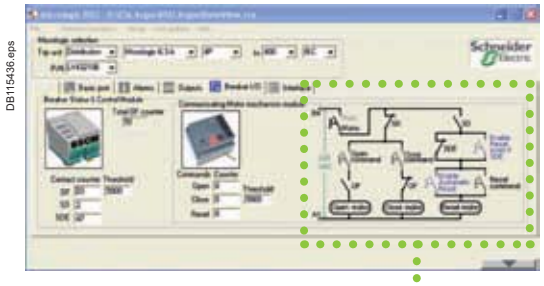
For reference only. www.fengshengelectric.com.sg

Compact NSX100 to 630 DC
Motor mechanism

Communicating motor mechanism (MTc) (1)

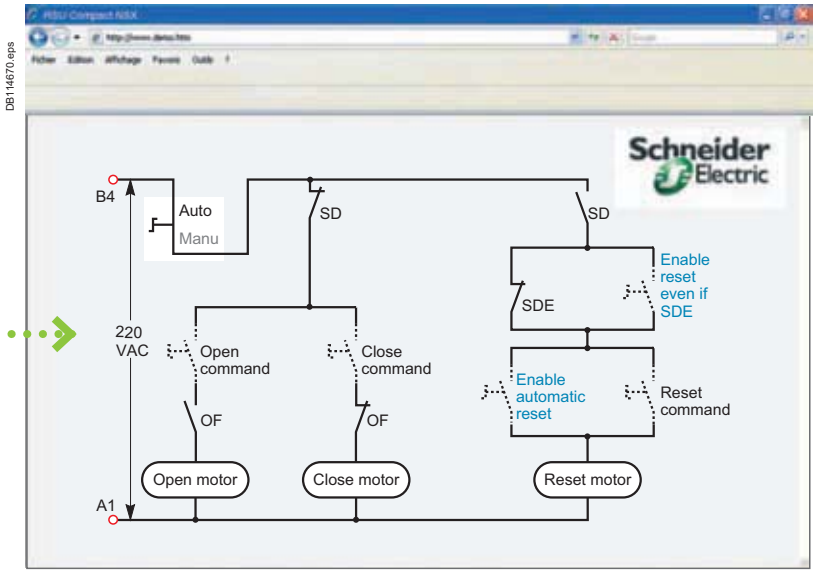


Schematic representation of the communicating motor mechanism (MT).



RSU utility setup screen for the communicating motor mechanism.

RSU screen for the communicating motor mechanism (MTc)



Single-line diagram of communicating motor mechanism
Opening, closing and reset orders are transmitted via the communication network. The "Enable automatic reset" and "Enable reset even if SDE" parameters must be set using the RSU software via the screen by clicking the blue text.

"**Auto/manu**" is a switch on the front of the motor mechanism.

Symbols

Q:	circuit breaker
B4, A1:	motor mechanism power supply
BSCM:	breaker status and control module

Terminals shown in red O must be connected by the customer.

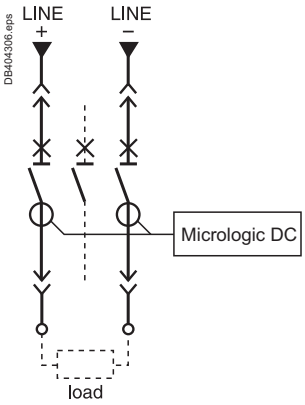
(1) NSX100-250 only.

For reference only. www.fengshengelectric.com.sg

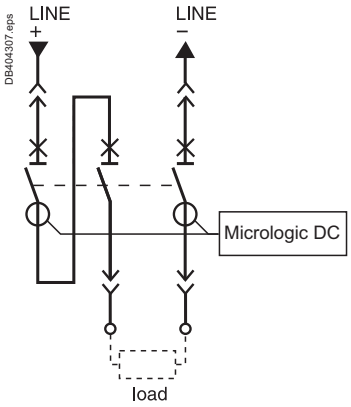
Masterpact NW10 to NW40 DC
Fixed and drawout devices

Diagrams are shown with circuits de-energised, all devices open, connected and charged and relays in the normal position.

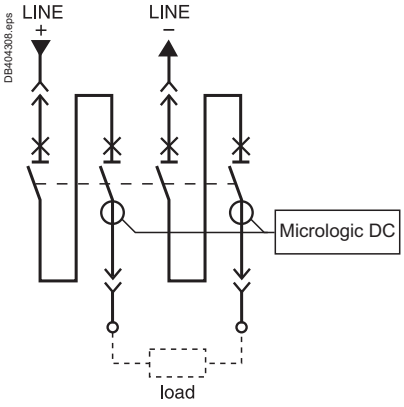
Version C



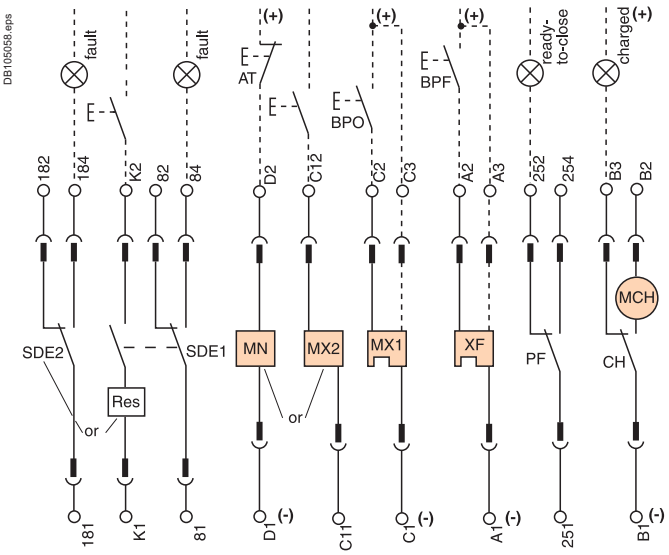
Version D



Version E



Remote operation



Control unit

Terminal block marking

Com : E1-E6 communication

E5	E6
E3	E4
E1	E2

Remote operation

SDE2 / Res	SDE1	MN / MX2	MX1	XF	PF	MCH
184 / K2	84	D2 / C12	C2	A2	254	B2
182	82		C3	A3	252	B3
181 / K1	81	D1 / C11	C1	A1	251	B1

SDE2: fault-trip indication contact
or
Res: remote reset

SDE1: fault-trip indication contact (supplied as standard)

MN: undervoltage release
or
MX2: shunt release

MX1: shunt release (standard or communicating)

XF: closing release (standard or communicating)

PF: ready-to-close contact

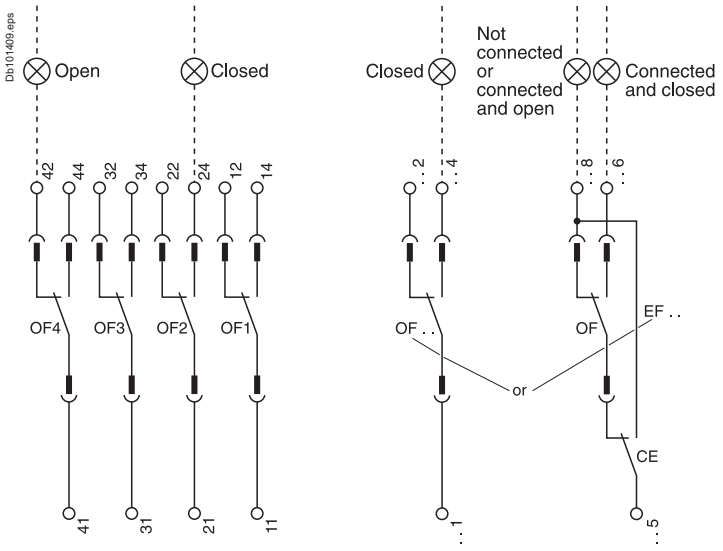
MCH: electric motor

Note:
When communicating MX or XF releases are used, the third wire (C3,A3) must be connected even if the communication module is not installed.

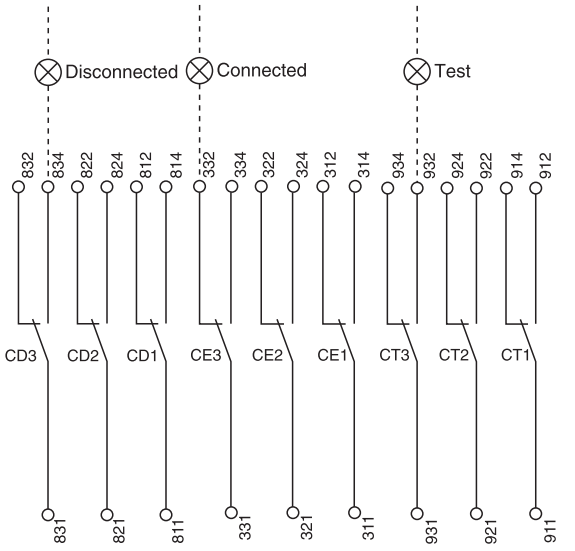
For reference only. www.fengshengelectric.com.sg

Masterpact NW10 to NW40 DC
Fixed and drawout devices

Indication contacts



Chassis contacts



Indication contacts

OF4	OF3	OF2	OF1
44	34	24	14
42	32	22	12
41	31	21	11

OF24	OF23	OF22	OF21	OF14	OF13	OF12	OF11
244	234	224	214	144	134	124	114
242	232	222	212	142	132	122	112
241	231	221	211	141	131	121	111

or

EF24	EF23	EF22	EF21	EF14	EF13	EF12	EF11
248	238	228	218	148	138	128	118
246	236	226	216	146	136	126	116
245	235	225	215	145	135	125	115

Chassis contacts

CD3	CD2	CD1	CE3	CE2	CE1	CT3	CT2	CT1
834	824	814	334	324	314	934	924	914
832	822	812	332	322	312	932	922	912
831	821	811	331	321	311	931	921	911

or

CE6	CE5	CE4
364	354	344
362	352	342
361	351	341

or

CE9	CE8	CE7
394	384	374
392	382	372
391	381	371

Indication contacts

OF4, OF3, OF2, OF1 — ON/OFF indication contacts

OF24 or EF24 — ON/OFF indication contacts. Combined "connected-closed" indication contacts

OF22 or EF22

OF21 or EF21

OF14 or EF14

OF13 or EF13

OF12 or EF12

OF11 or EF11

Chassis contacts

CD3, CD2, CD1 — Disconnected position contacts

CE3, CE2, CE1 — Connected position contacts

CT3, CT2, CT1 — Test position contacts

or

CE6, CE5, CE4 — Connected position contacts

or

CE9, CE8, CE7 — Connected position contacts

or

CD6, CD5, CD4 — Disconnected position contacts

Legend:

Drawout device only.

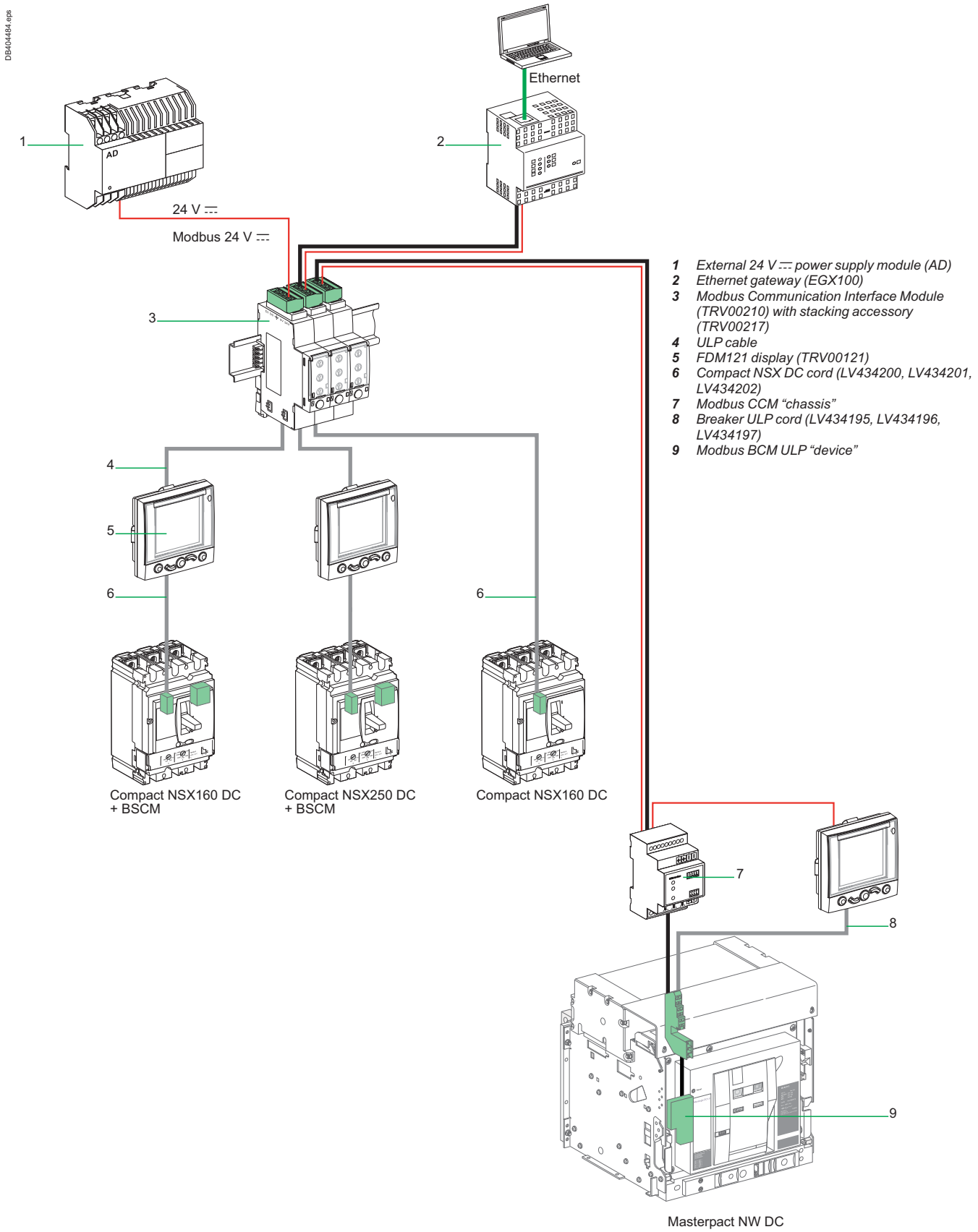
XXX SDE1, OF1, OF2, OF3, OF4 supplied as standard.

Interconnected connections (only one wire per connection point).

For reference only. www.fengshengelectric.com.sg

Masterpact NW DC
Communication

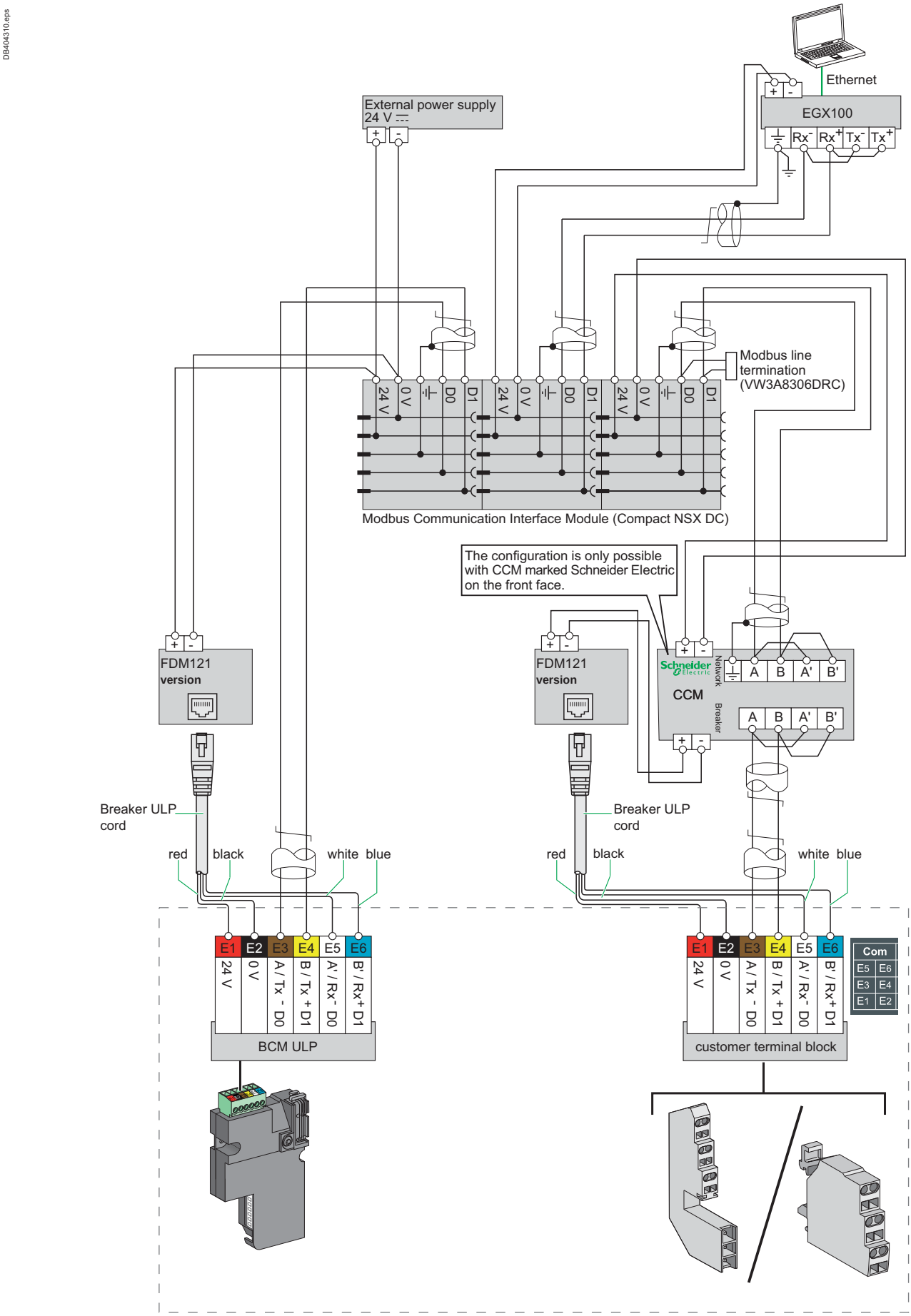
Connection of circuit breakers to the Modbus communication network



1 *External 24 V ⎓ power supply module (AD)*
2 *Ethernet gateway (EGX100)*
3 *Modbus Communication Interface Module (TRV00210) with stacking accessory (TRV00217)*
4 *ULP cable*
5 *FDM121 display (TRV00121)*
6 *Compact NSX DC cord (LV434200, LV434201, LV434202)*
7 *Modbus CCM "chassis"*
8 *Breaker ULP cord (LV434195, LV434196, LV434197)*
9 *Modbus BCM ULP "device"*

For reference only. www.fengshengelectric.com.sg

Masterpact NW DC
Communication

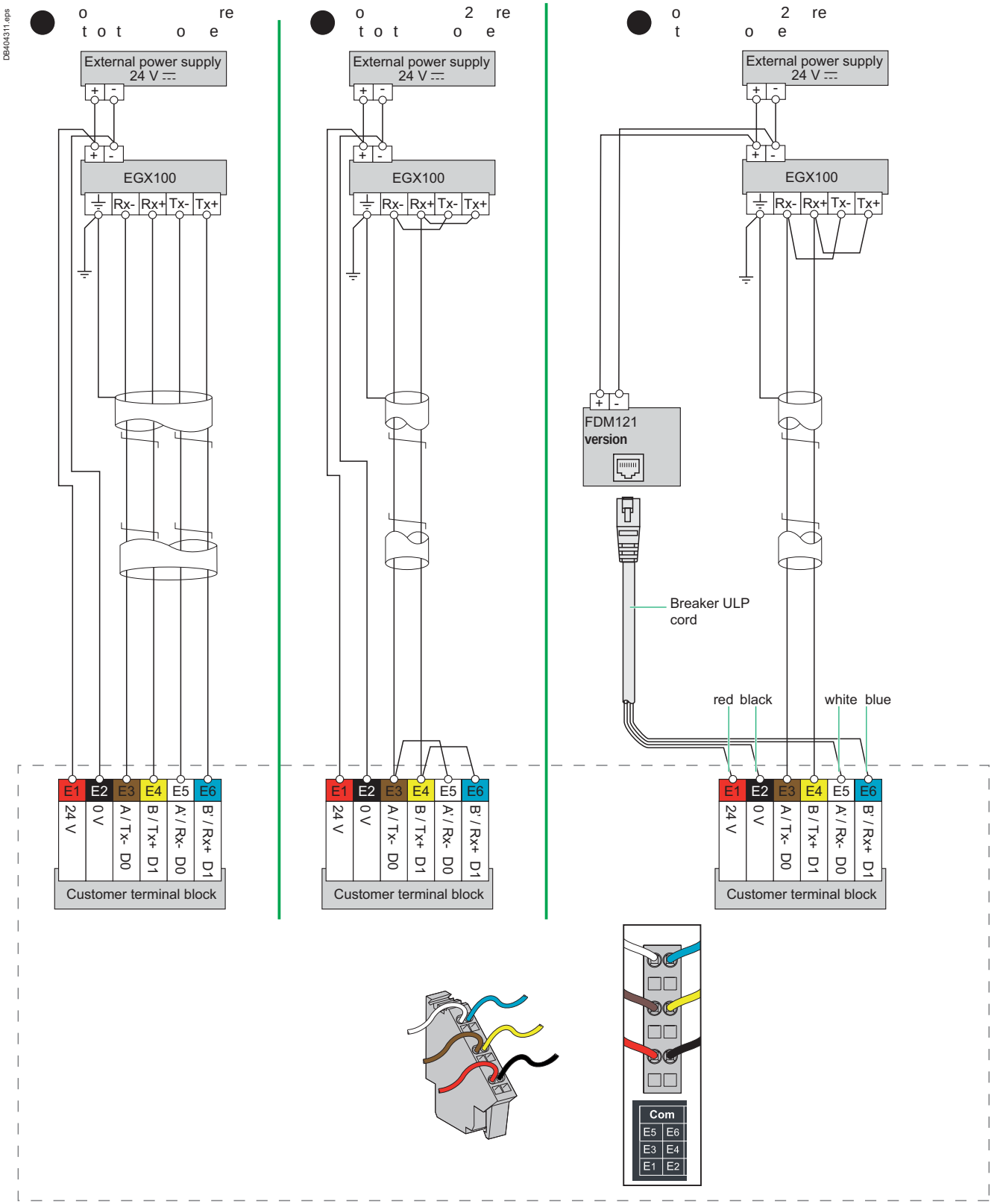


For reference only. www.fengshengelectric.com.sg

Fixed, electrically operated Masterpact NW DC

Wiring of the COM option (with BCM ULP) and external power supply

To setup 4 wires and 2 wires, use the utility RSU.

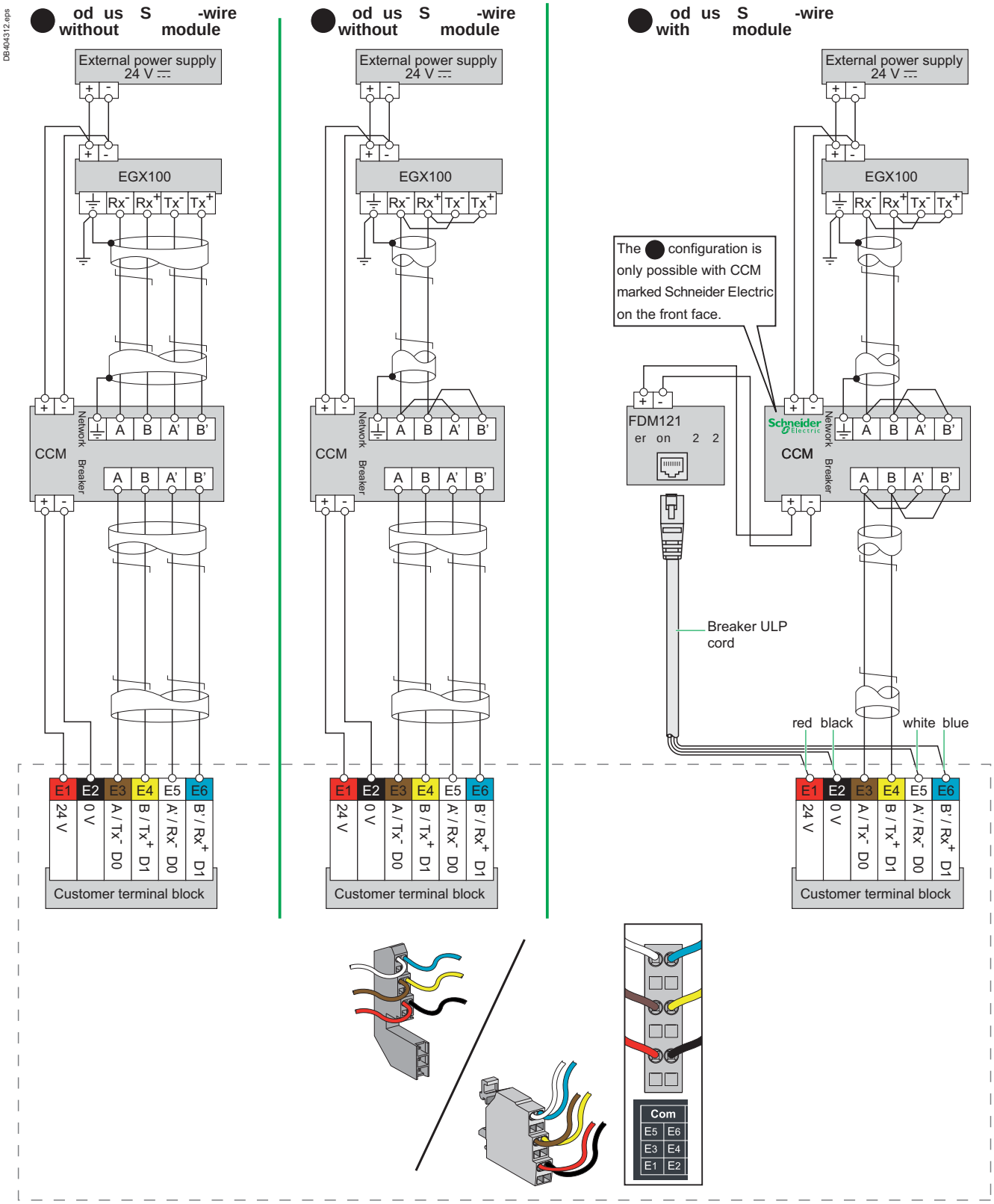


For reference only. www.fengshengelectric.com.sg

Withdrawable Masterpact NW DC

Wiring of the COM option (with CCM) and external power supply

To setup 4 wires and 2 wires, use the utility RSU.



For reference only. www.fengshengelectric.com.sg

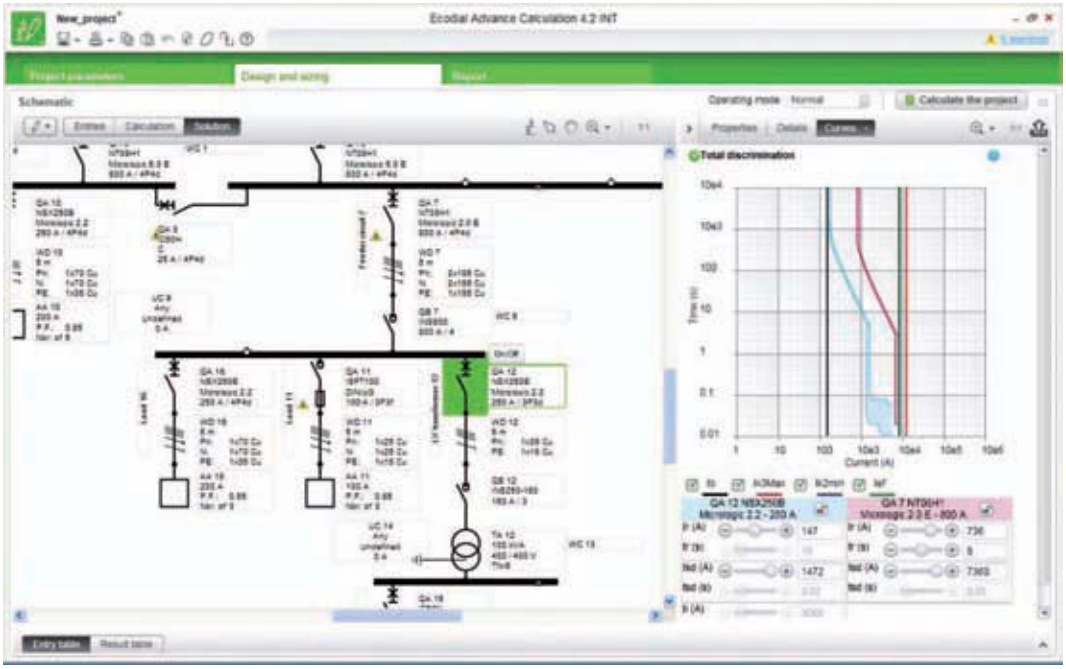
TOOLS

Ecodial

Ecodial software is dedicated to LV electrical installation calculation in accordance with the IEC60364 international standard or national standards.

This 4th generation, "Ecodial Advance Calculation 4", offers a new ergonomic and new features:

- operating mode that allows easy calculation in case of installation with different type of sources (parallel transformers, back-up generators...)
- discrimination analysis associating curves checking and discrimination tables
- direct access to protection settings including residual current protections
- easy selection of alternate solutions or manual selection of a product.



Schneider Electric
For reference only. www.fengshengelectric.com.sg

Additional characteristics

Presentation 2
Functions and characteristics A-1
Installation recommendations B-1
Dimensions and connection C-1
Electrical diagrams D-1

Compact NSX100 to 250 DC
Tripping curves E-2

Compact NSX400 to 630 DC
Tripping curves E-5

Masterpact NW10 to NW40 DC
Tripping curves E-6

Current and energy limiting curves
Compact NSX DC E-13
Protection discrimination E-14

Protection discrimination
Upst.: Compact NSX100 DC and NSX160 DC
Downstream: Compact NSX100 DC and NSX160 DC E-15
Upstream: Compact NSX250 DC
Downstream: Compact NSX100 and NSX250 DC E-16
Upstream: Compact NSX400-NSX630 DC
Downstream: Compact NSX100 to NSX630 DC E-17
Upstream: Masterpact NW10 DC
Downstream: Compact NSX100 to NSX630 DC, Masterpact NW10 DC E-18
Protection discrimination Upstream: Masterpact NW10 DC and NW20 DC
Downstream: Compact NSX100 to NSX630 DC,
Masterpact NW10 DC and NW20 DC E-19
Upstream: Masterpact NW20 DC and NW40 DC
Downstream: Compact NSX100 to NSX630 DC,
Masterpact NW10 to NW40 DC E-20

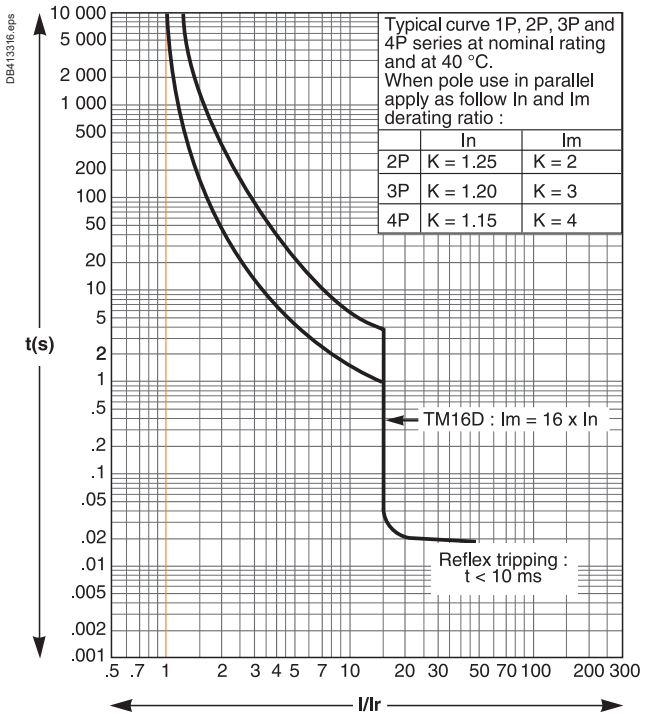
Catalogue numbers and order form *F-1*

For reference only. www.fengshengelectric.com.sg

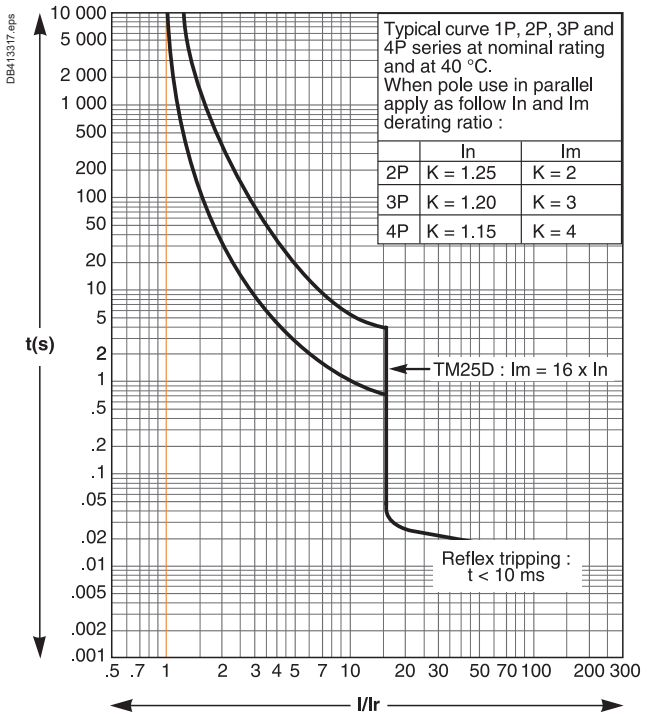
Compact NSX100 to 250 DC
Tripping curves

TM magnetic trip units

TM16D / TM16G

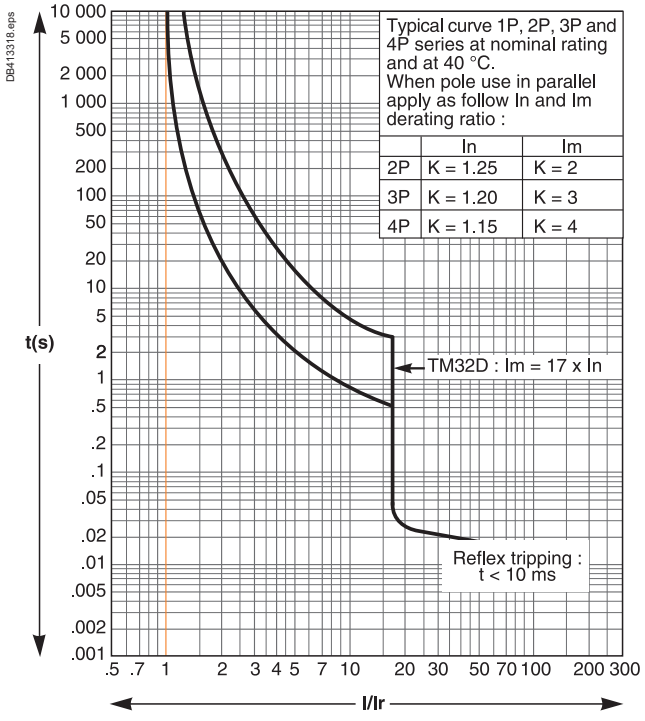


TM25D / TM25G

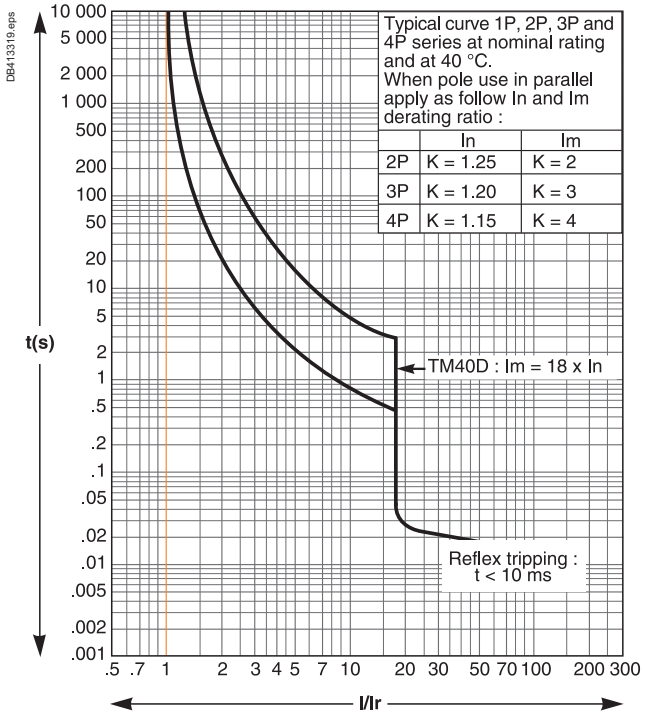


Reflex tripping.

TM32D



TM40D



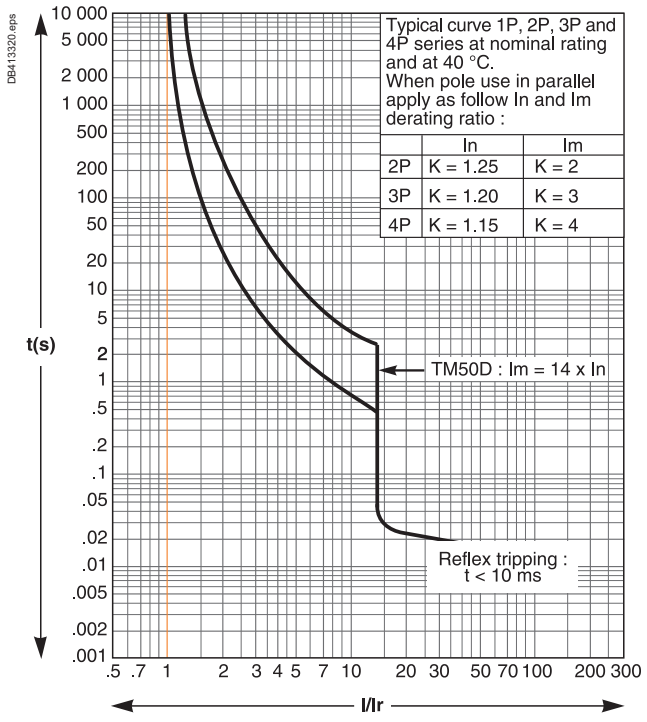
Reflex tripping.

For reference only. www.fengshengelectric.com.sg

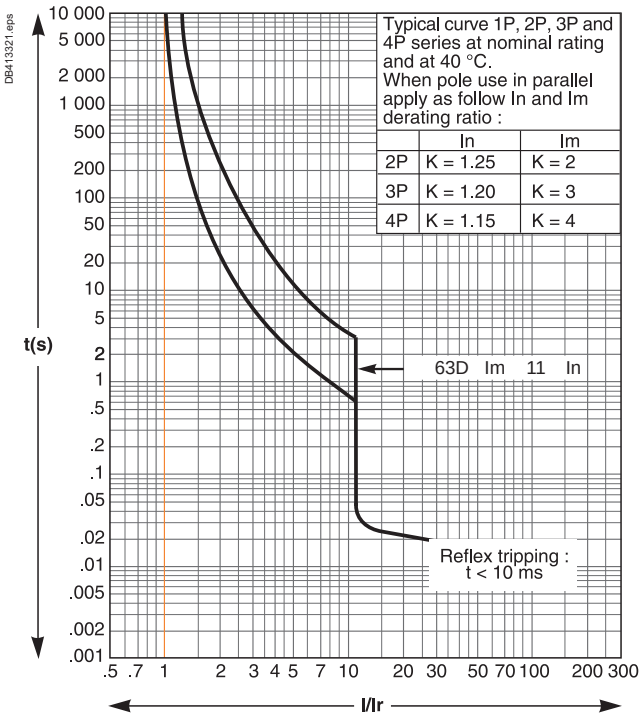
Compact NSX100 to 250 DC
Tripping curves

TM magnetic trip units (cont.)

TM50D

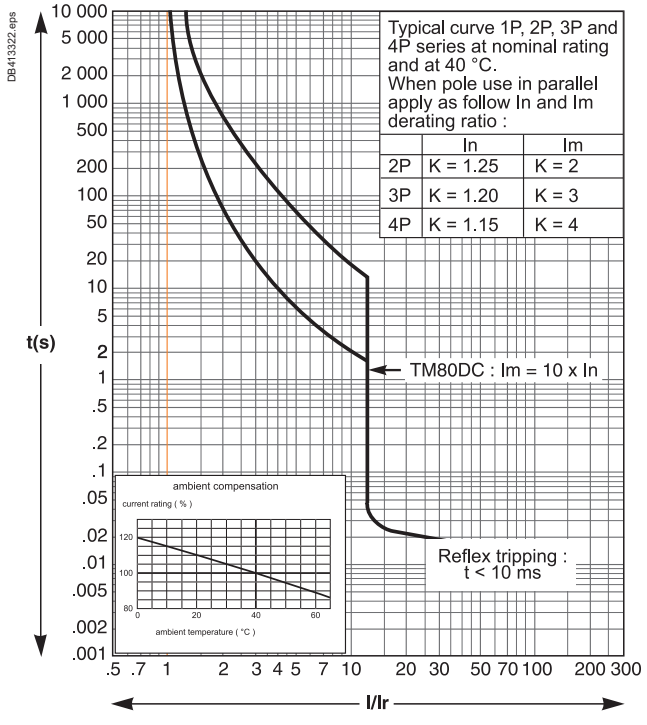


TM63D

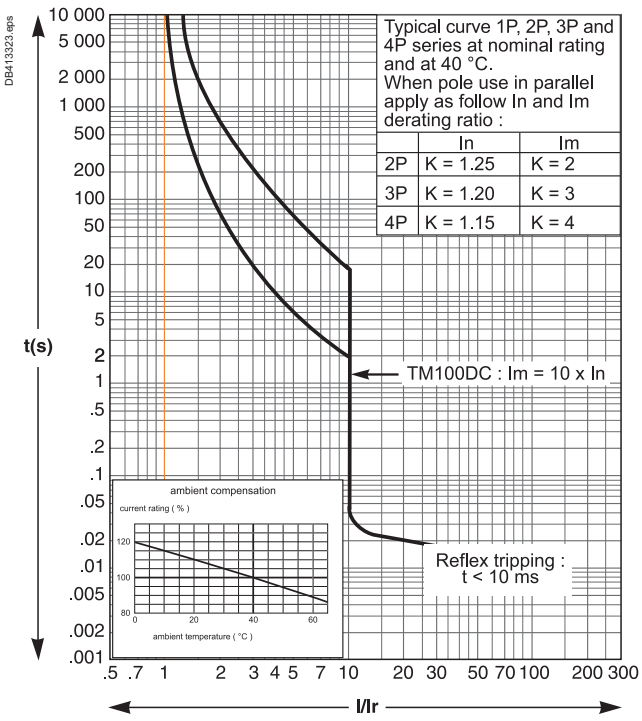


Reflex tripping.

TM80DC



TM100DC



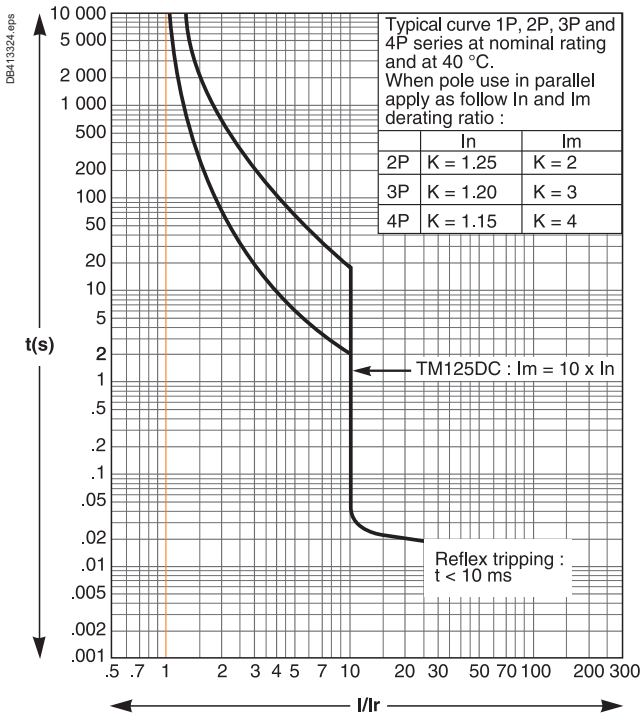
Reflex tripping.

For reference only. www.fengshengelectric.com.sg

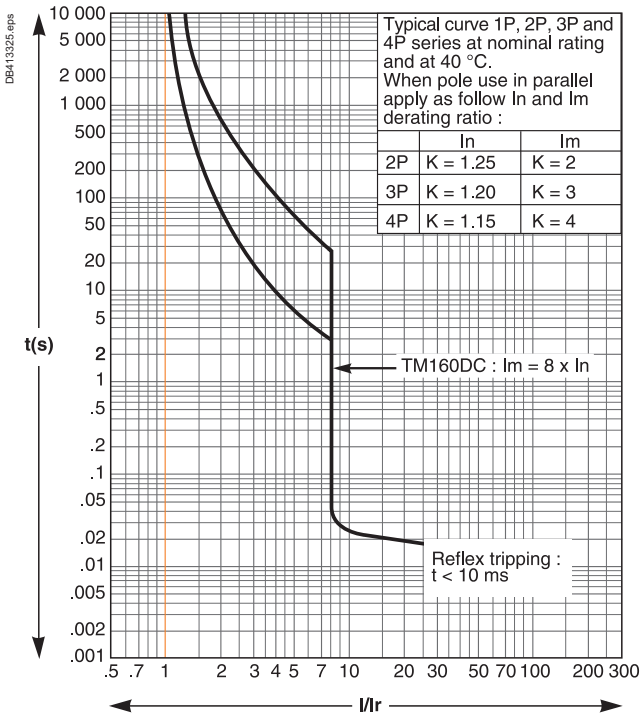
Compact NSX100 to 250 DC
Tripping curves

TM magnetic trip units (cont.)

TM125DC

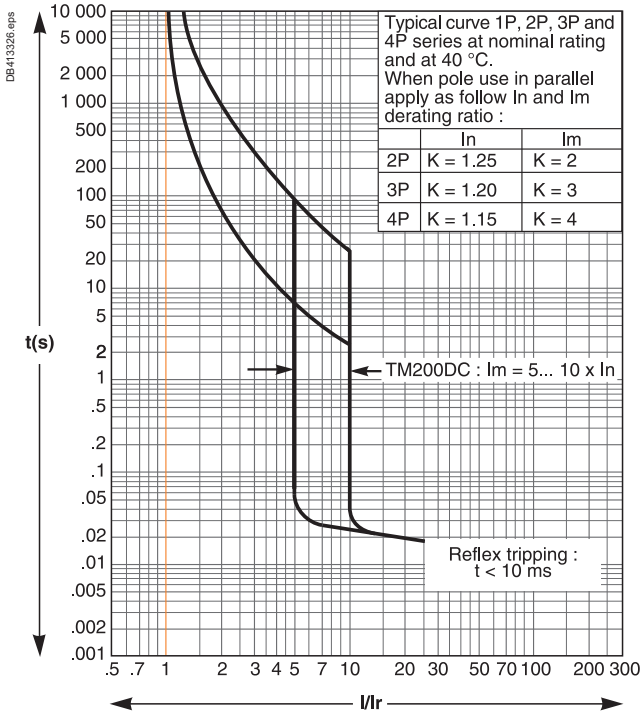


TM160DC

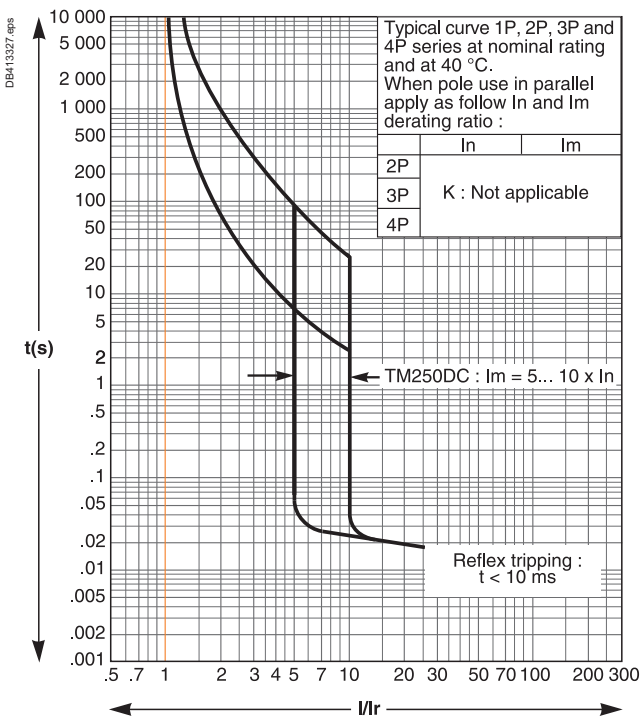


Reflex tripping.

TM200DC



TM250DC

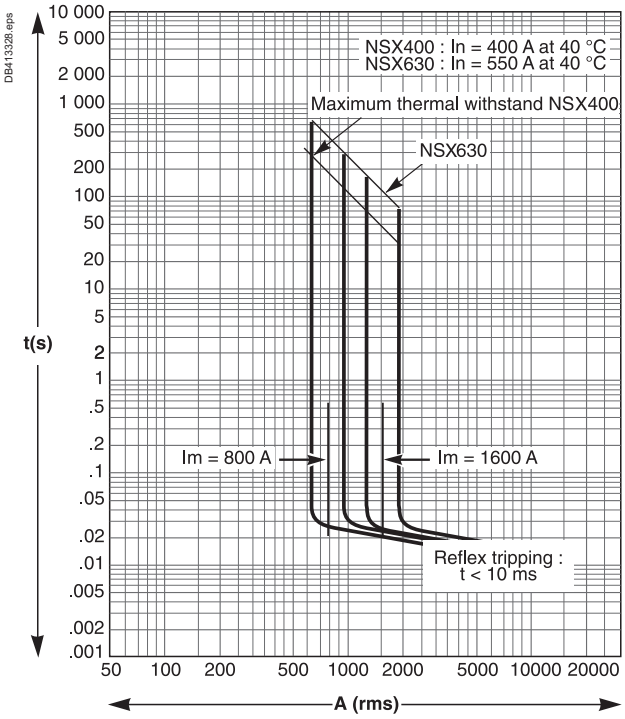


Reflex tripping.

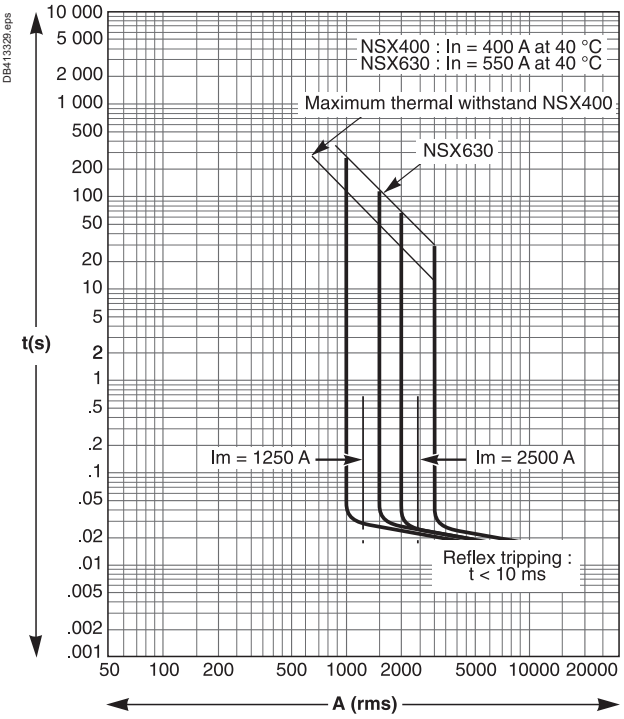
For reference only. www.fengshengelectric.com.sg

Compact NSX400 to 630 DC
Tripping curves

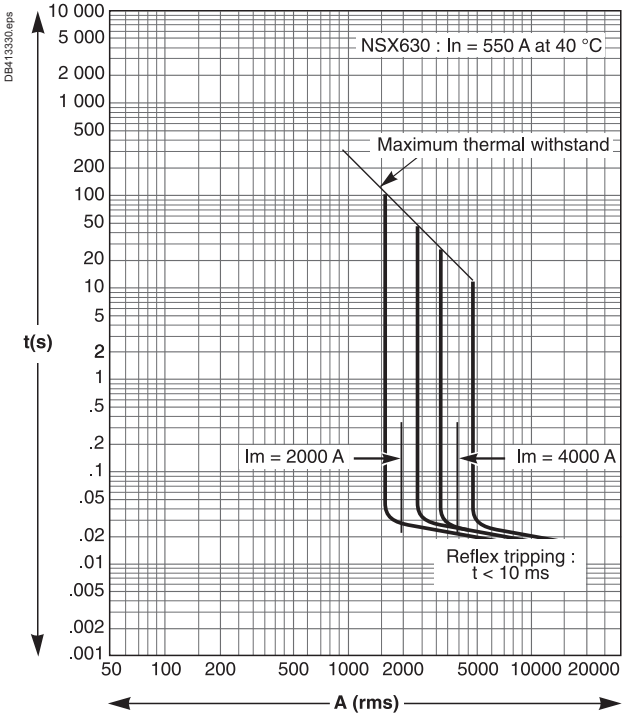
MP1 for NSX400/630 DC



MP2 for NSX400/630 DC



MP3 for NSX630 DC



For reference only. www.fengshengelectric.com.sg

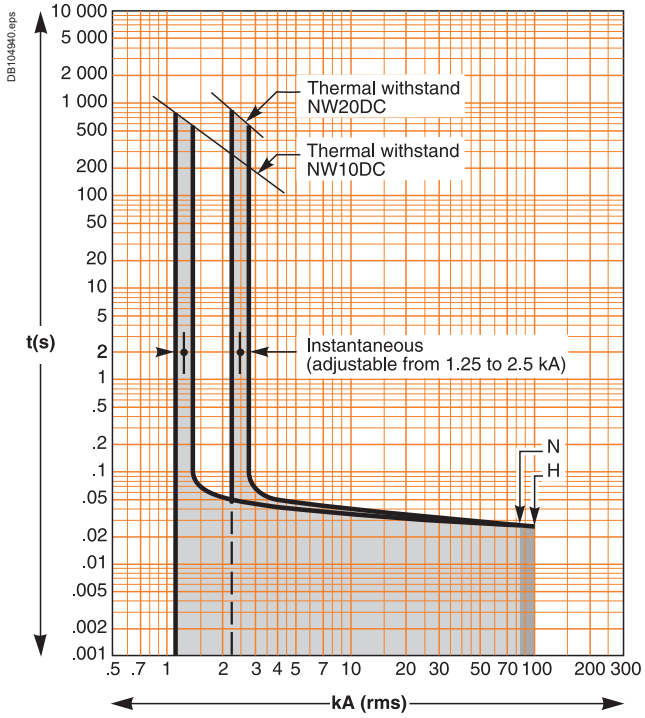
Masterpact NW10 to NW40 DC

Tripping curves

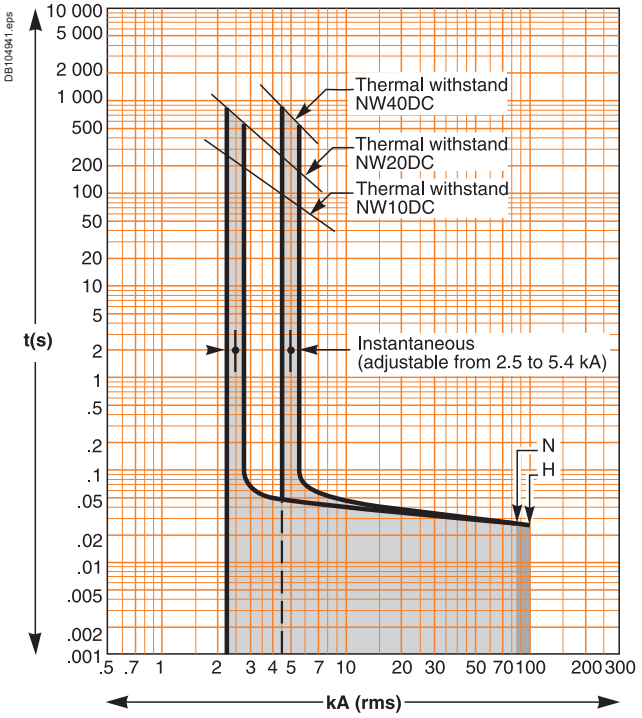
U = 500 V DC, L/R = 5 ms

Micrologic DC 1.0 instantaneous protection

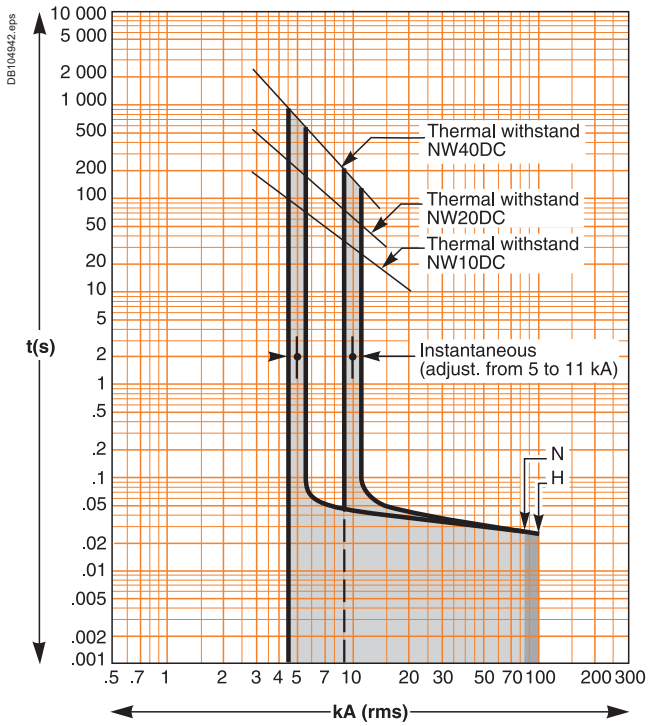
With 1250 - 2500 A sensors



With 2500 - 5400 A sensors



With 5000 - 11000 A sensors

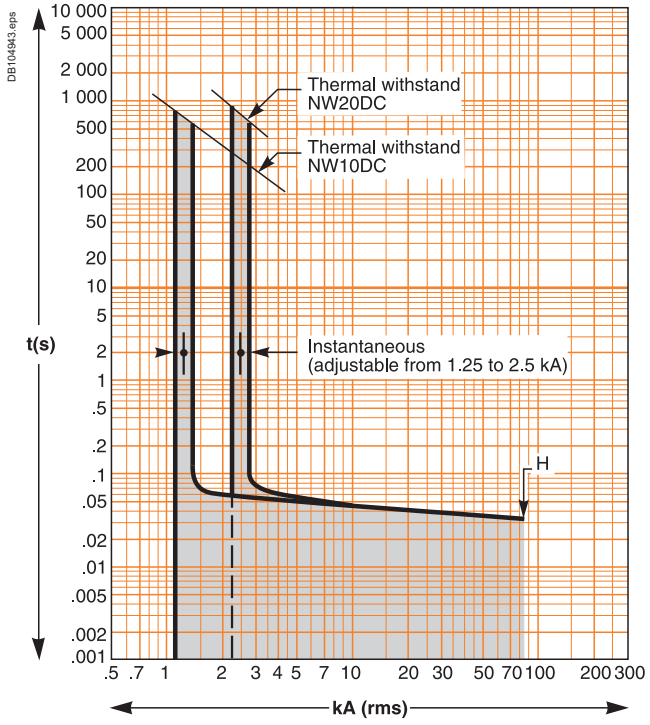


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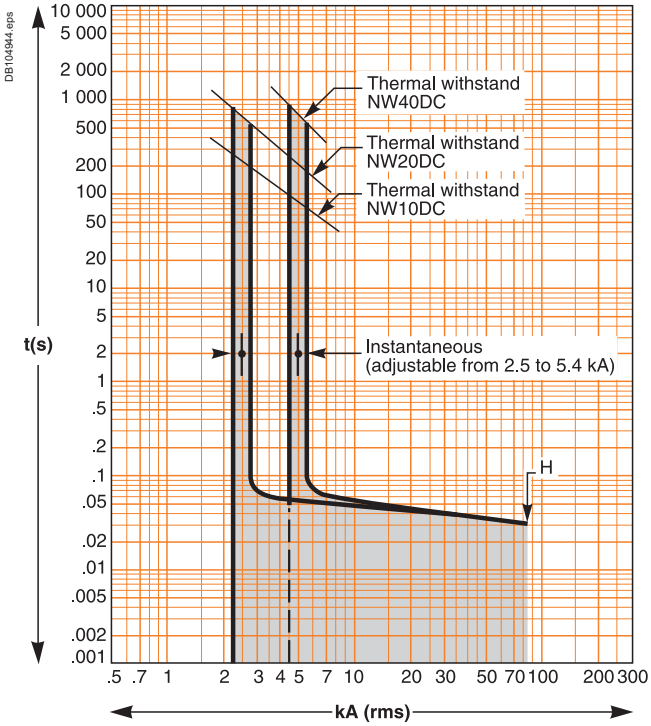
Masterpact NW10 to NW40 DC
Tripping curves
U = 750/900 V DC, L/R = 5 ms

Micrologic DC 1.0 instantaneous protection

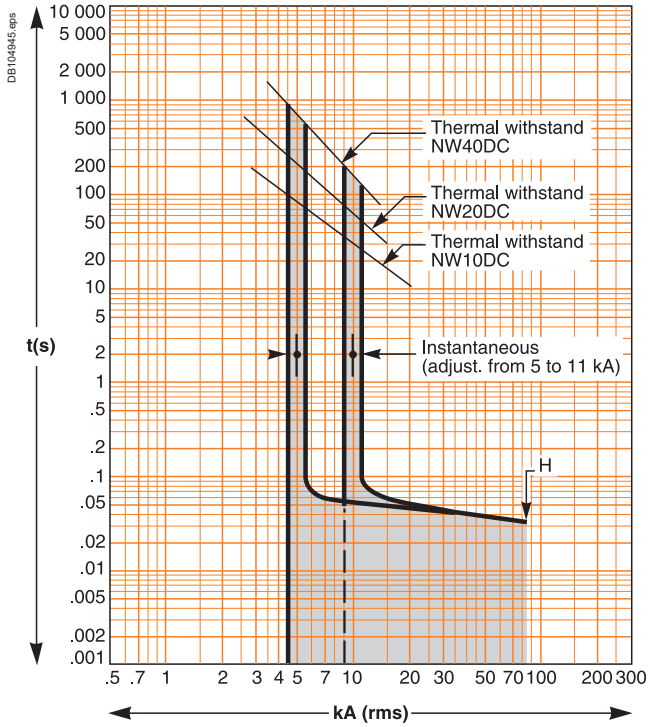
With 1250 - 2500 A sensors



With 2500 - 5400 A sensors



With 5000 - 11000 A sensors

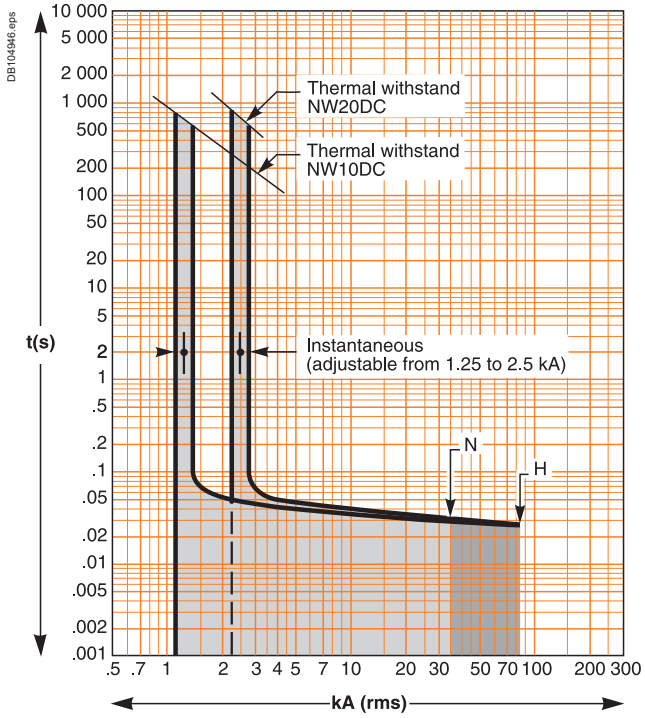


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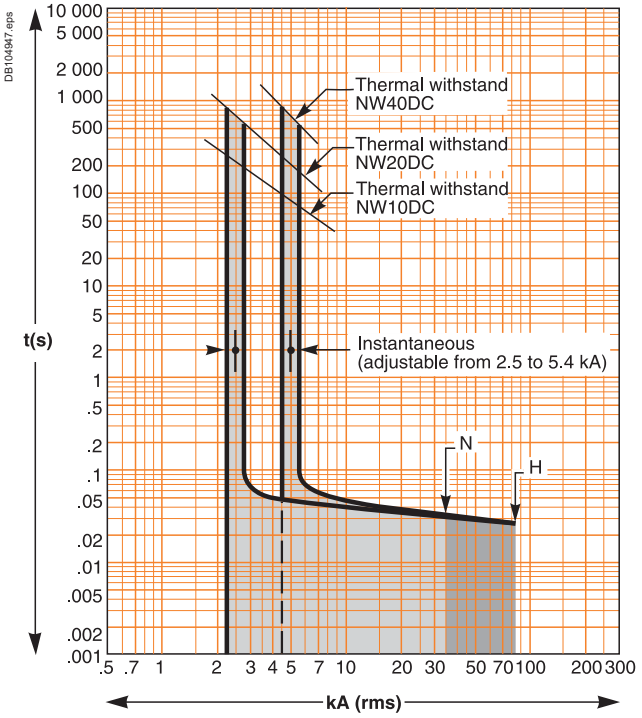
Masterpact NW10 to NW40 DC
Tripping curves
U = 500 V DC, L/R = 15 ms

Micrologic DC 1.0 instantaneous protection

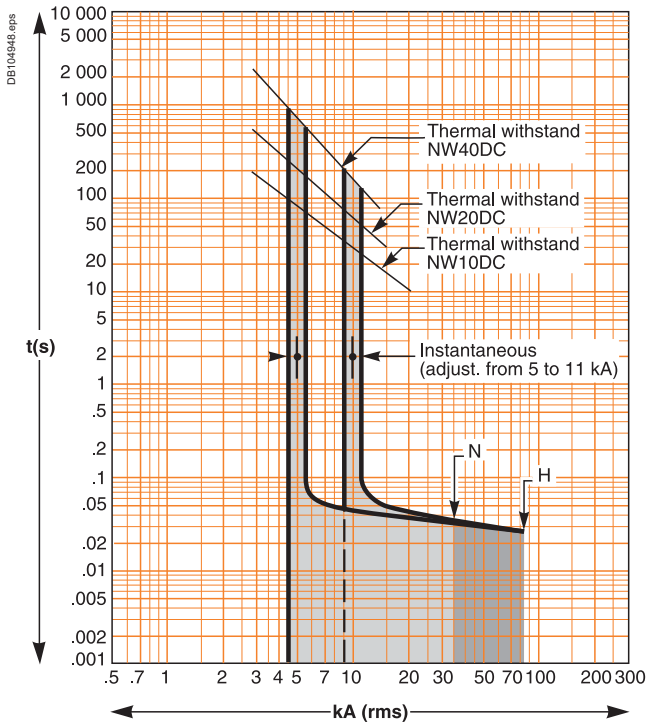
With 1250 - 2500 A sensors



With 2500 - 5400 A sensors



With 5000 - 11000 A sensors

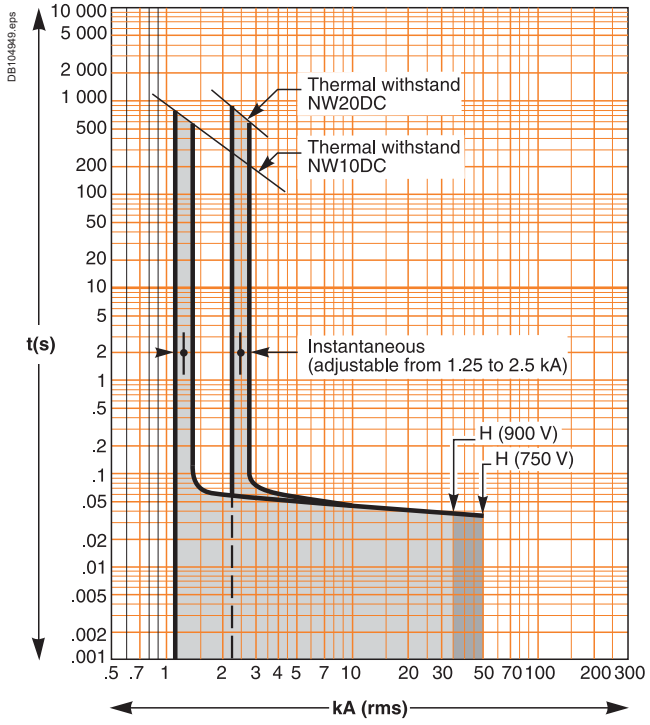


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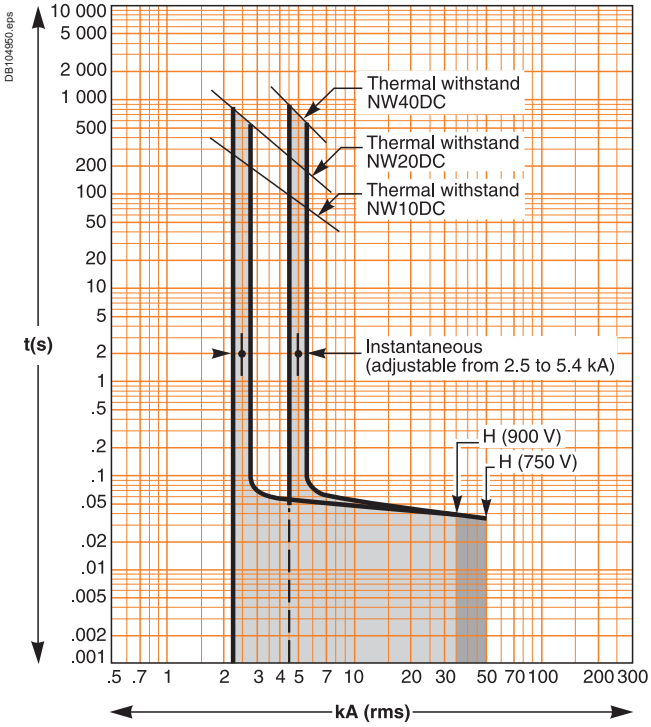
Masterpact NW10 to NW40 DC
Tripping curves
U = 750/900 V DC, L/R = 15 ms

Micrologic DC 1.0 instantaneous protection

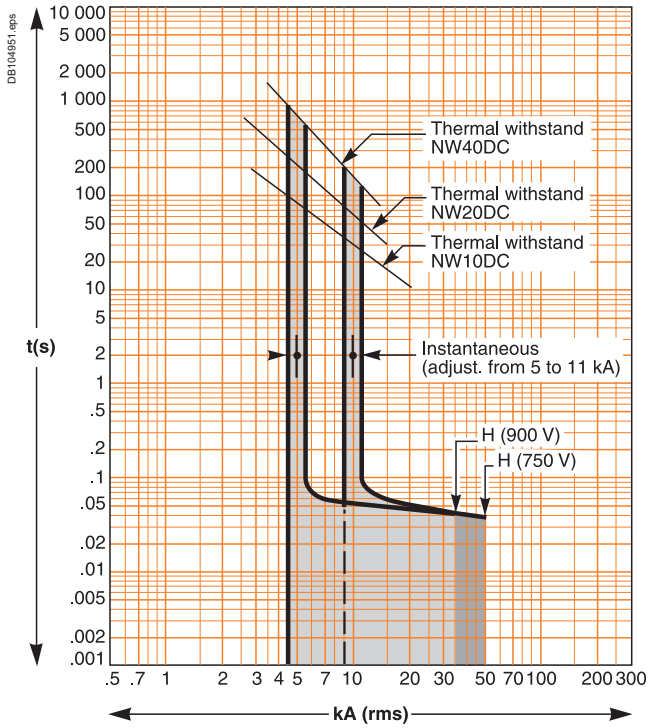
With 1250 - 2500 A sensors



With 2500 - 5400 A sensors



With 5000 - 11000 A sensors

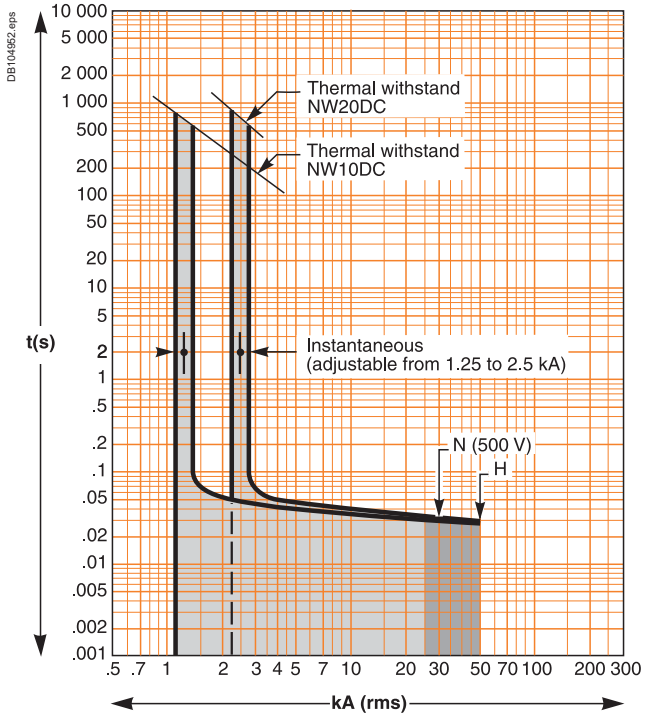


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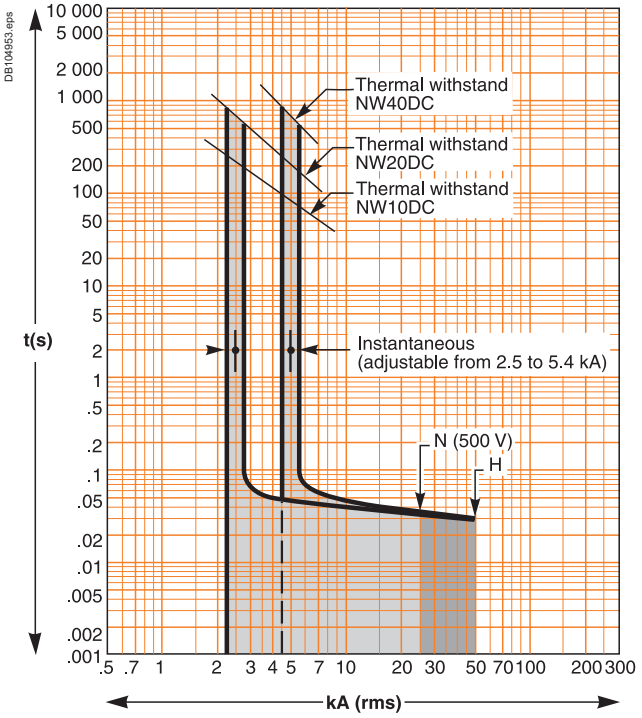
Masterpact NW10 to NW40 DC
Tripping curves
U = 500/750 V DC, L/R = 30 ms

Micrologic DC 1.0 instantaneous protection

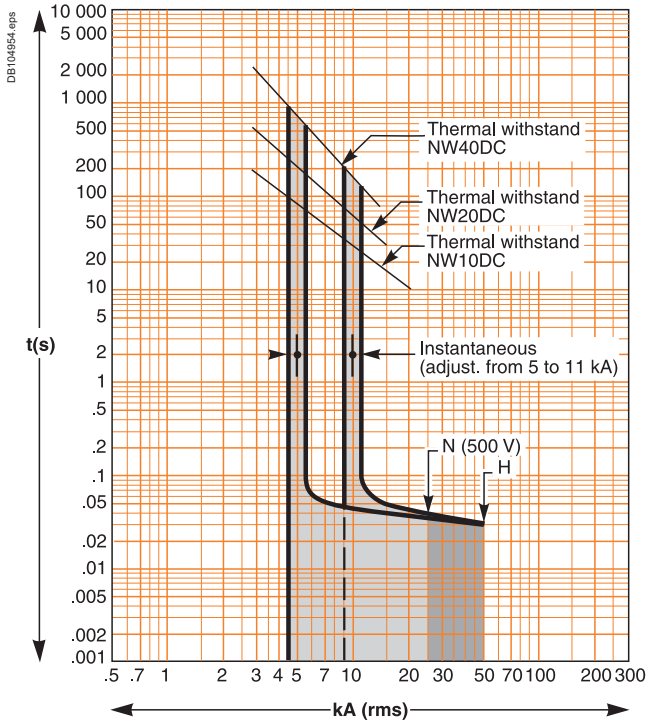
With 1250 - 2500 A sensors



With 2500 - 5400 A sensors



With 5000 - 11000 A sensors

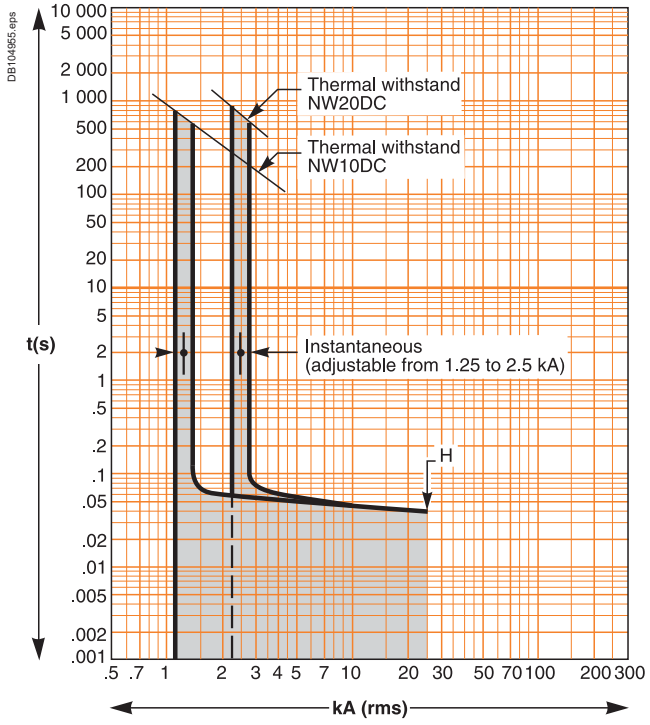


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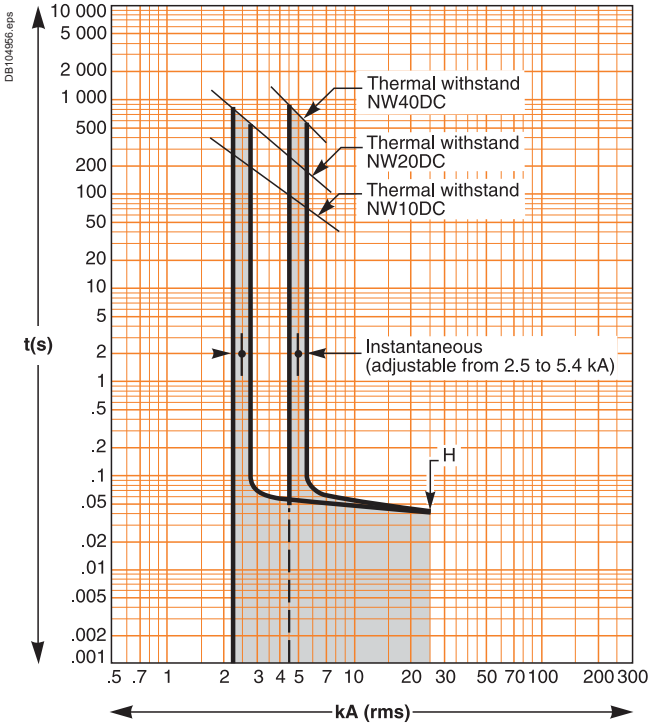
Masterpact NW10 to NW40 DC
Tripping curves
U = 900 V DC, L/R = 30 ms

Micrologic DC 1.0 instantaneous protection

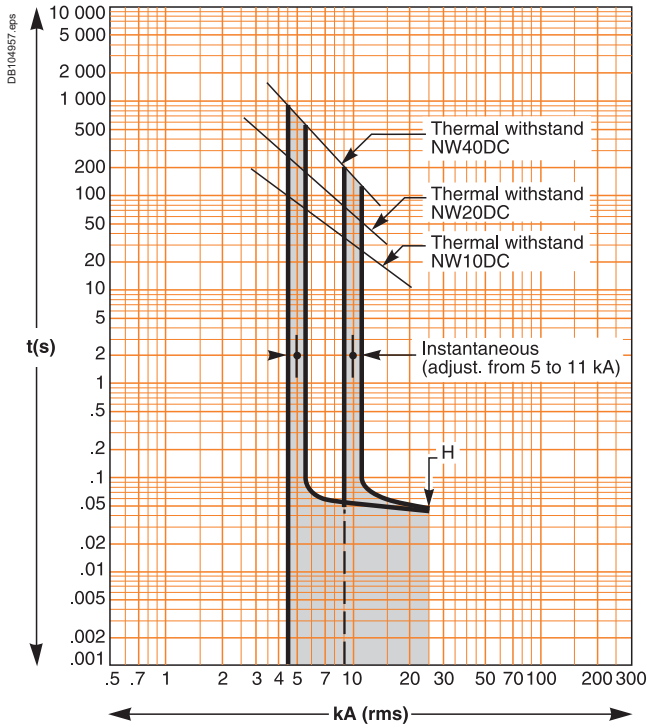
With 1250 - 2500 A sensors



With 2500 - 5400 A sensors



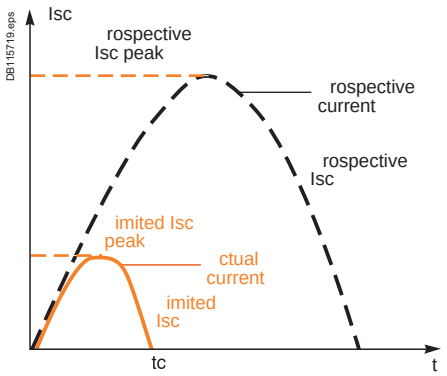
With 5000 - 11000 A sensors



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Current and energy limiting curves

The limiting capacity of a circuit breaker is its aptitude to let through a current, during a short-circuit, that is less than the prospective short-circuit current.



The exceptional limiting capacity of the Compact NSX DC range is due to the rotating double-break technique (very rapid natural repulsion of contacts and the appearance of two arc voltages in-series with a very steep wave front).

Ics = 100 % Icu

The exceptional limiting capacity of the Compact NSX DC range greatly reduces the forces created by fault currents in devices.
The result is a major increase in breaking performance.
In particular, the service breaking capacity Ics is equal to 100 % of Icu.
The Ics value, defined by IEC standard 60947-2, is guaranteed by tests comprising the following steps:

- ■ break three times consecutively a fault current equal to 100 % of Icu
- ■ check that the device continues to function normally, that is:
- □ it conducts the rated current without abnormal temperature rise
- □ protection functions perform within the limits specified by the standard
- □ suitability for isolation is not impaired.

Longer service life of electrical installations

Current-limiting circuit breakers greatly reduce the negative effects of short-circuits on installations.

Thermal effects
Less temperature rise in conductors, therefore longer service life for cables.

Mechanical effects
Reduced electrodynamic forces, therefore less risk of electrical contacts or busbars being deformed or broken.

Electromagnetic effects
Fewer disturbances for measuring devices located near electrical circuits.

Economy by means of cascading

Cascading is a technique directly derived from current limiting. Circuit breakers with breaking capacities less than the prospective short-circuit current may be installed downstream of a limiting circuit breaker. The breaking capacity is reinforced by the limiting capacity of the upstream device. It follows that substantial savings can be made on downstream equipment and enclosures.

Current and energy limiting curves

The limiting capacity of a circuit breaker is expressed by two curves which are a function of the prospective short-circuit current (the current which would flow if no protection devices were installed):

- ■ the actual peak current (limited current)
- ■ thermal stress (A^2s), i.e. the energy dissipated by the short-circuit in a conductor with a resistance of 1 Ω.

Example
What is the real value of a 150 kA rms prospective short-circuit (i.e. 330 kA peak) limited by an NSX250L DC upstream ?
The answer is 30 kA peak (curve page E-13).

Maximum permissible cable stresses

The table below indicates the maximum permissible thermal stresses for cables depending on their insulation, conductor (Cu or Al) and their cross-sectional area (CSA). CSA values are given in mm² and thermal stresses in A^2s.

CSA		1.5 mm²	2.5 mm²	4 mm²	6 mm²	10 mm²
PVC	Cu	2.97×10^4	8.26×10^4	2.12×10^5	4.76×10^5	1.32×10^6
	Al					5.41×10^5
PRC	Cu	4.10×10^4	1.39×10^5	2.92×10^5	6.56×10^5	1.82×10^6
	Al					7.52×10^5
CSA		**16 mm²**	**25 mm²**	**35 mm²**	**50 mm²**	
PVC	Cu	3.4×10^6	8.26×10^6	1.62×10^7	3.31×10^7	
	Al	1.39×10^6	3.38×10^6	6.64×10^6	1.35×10^7	
PRC	Cu	4.69×10^6	1.39×10^7	2.23×10^7	4.56×10^7	
	Al	1.93×10^6	4.70×10^6	9.23×10^6	1.88×10^7	

Example
Is a Cu/PVC cable with a CSA of 10 mm² adequately protected by an NSX160F?
The table above indicates that the permissible stress is 1.32×10^6 A^2s.
All short-circuit currents at the point where an NSX160F (Icu = 35 kA) is installed are limited with a thermal stress less than 6×10^5 A^2s (curve page E-13).
Cable protection is therefore ensured up to the limit of the breaking capacity of the circuit breaker.

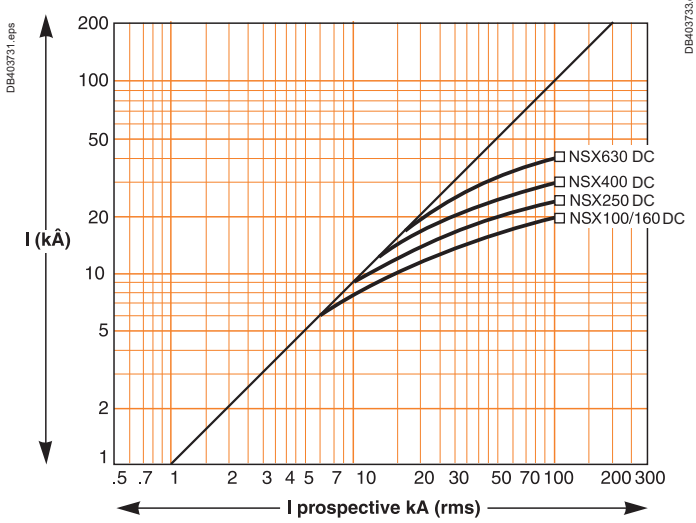
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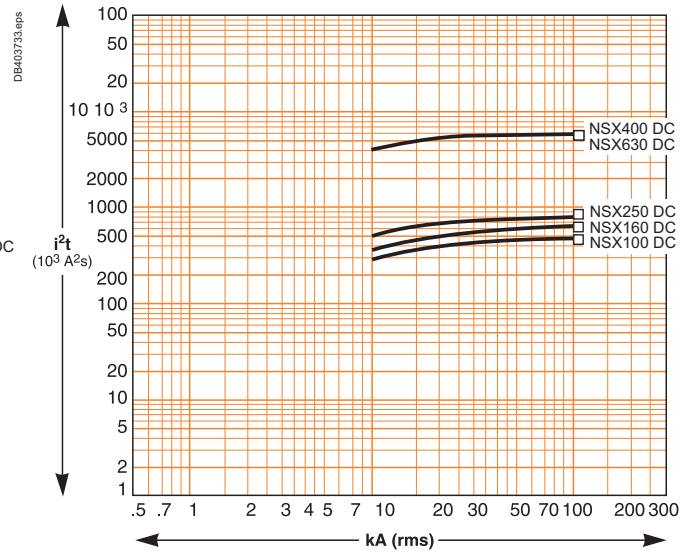
Current and energy limiting curves
Compact NSX DC

Current-limiting curves and thermal stress for L/R = 5 ms

Peak current U < 250 V DC: 1P
250 V < U < 500 V DC: 2P
500 V < U < 750 V DC: 3P

Thermal stress U < 250 V DC: 1P
250 V < U < 500 V DC: 2P

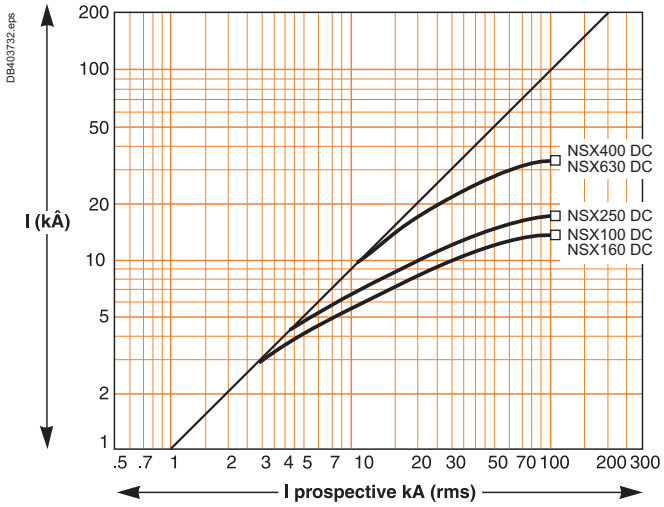


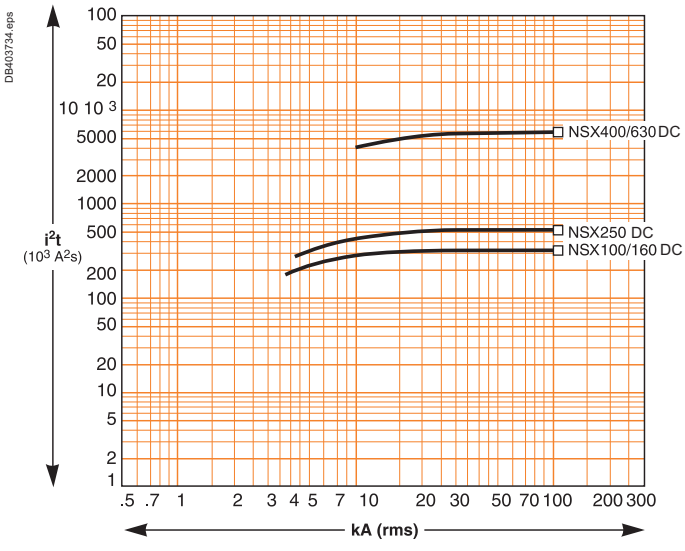


Current-limiting curves and thermal stress for L/R = 15 ms

Peak current U < 250 V DC: 1P
250 V < U < 500 V DC: 2P
500 V < U < 750 V DC: 3P

Thermal stress U < 250 V DC: 1P
250 V < U < 500 V DC: 2P





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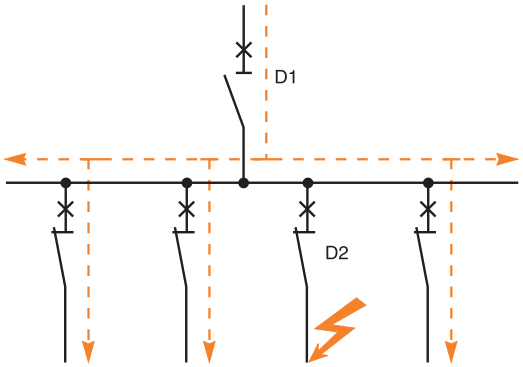
Compact NSX100 DC to NSX630 DC

Protection discrimination

Protection discrimination is an essential element that must be taken into account starting at the design stage of a low voltage installation to ensure the highest level of availability for users.
Discrimination is important in all installations for the comfort of users, however it is fundamental in installations requiring a high level of service continuity, e.g. industrial manufacturing processes.
Industrial installations without discrimination run a series of risks of varying importance including:

- production deadline overruns
- interruption in manufacturing, entailing:
  - production or finished-product losses
  - risk of damage to production machines in continuous processes
- restarting of machines, one by one, following a general power outage
- shutdown of vital safety equipment such as lubrification pumps, smoke fans, etc.

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What is discrimination?

Discrimination, also called selectivity, is the coordination of automatic protection devices in such a manner that a fault appearing at a given point in a network is cleared by the protection device installed immediately upstream of the fault, and by that device alone.

- **total discrimination**

Discrimination is said to be total if, for all fault current values, from overloads up to the non-resistive short-circuit current, circuit breaker D2 opens and D1 remains closed.

- **partial discrimination**

Discrimination is partial if the above condition is not respected up to the full short-circuit current, but only to a lesser value termed the selectivity limit current (Is).

- **no discrimination**

In the event of a fault, both circuit breakers D1 and D2 open.

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Protection discrimination

Upst.: Compact NSX100 DC and NSX160 DC
Downstream: Compact NSX100 DC and NSX160 DC

	Upstream	Compact NSX100 DC - Thermal magnetic protection							
	Type of trip unit	TM16D	TM25D	TM32D	TM40D	TM50D	TM63D	TM80DC	TM100DC
	Fixed or adjustable	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
	Im (A)	260	400	550	700	700	700	640	800
Downstream	**Rating In (A)**								
Compact NSX100 DC	**16**			550	700	700	700	640	800
TM-D trip units	**25**				700	700	700	640	800
	32						700	640	800
	40							640	800
	50							640	800
	63								800
TM-DC trip units	**80**								
	100								

	Upstream	Compact NSX160 DC - Thermal magnetic protection									
	Type of trip unit	TM16D	TM25D	TM32D	TM40D	TM50D	TM63D	TM80DC	TM100DC	TM125DC	TM160DC
	Fixed or adjustable	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
	Im (A)	260	400	550	700	700	700	640	800	1250	1250
Downstream	**Rating In (A)**										
Compact NSX100 DC	**16**			550	700	700	700	640	800	1250	1250
TM-D trip units	**25**				700	700	700	640	800	1250	1250
	32						700	640	800	1250	1250
	40							640	800	1250	1250
	50							640	800	1250	1250
	63								800	1250	1250
TM-DC trip units	**80**										1250
	100										1250
Compact NSX160 DC	**16**			550	700	700	700	640	800	1250	1250
TM-D trip units	**25**				700	700	700	640	800	1250	1250
	32						700	640	800	1250	1250
	40							640	800	1250	1250
	50							640	800	1250	1250
	63								800	1250	1250
TM-DC trip units	**80**										1250
	100										1250
	125										
	160										

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Protection discrimination

Upstream: Compact NSX250 DC
Downstream: Compact NSX100 and NSX250 DC

	Upstream	Compact NSX250 DC - Thermal magnetic protection							
	Type of trip unit	TM80DC	TM100DC	TM125DC	TM160DC	TM200DC		TM250DC	
	Fixed or adjustable	Fixed	Fixed	Fixed	Fixed	Adjustable		Adjustable	
						Min.	Max.	Min.	Max.
	Im (A)	640	800	1250	1250	1000	2000	1250	2500
Downstream	**Rating In (A)**								
Compact NSX100 DC	**16**	640	800	1250	1250	1000	2000	1250	2500
TM-D trip units	**25**	640	800	1250	1250	1000	2000	1250	2500
	32	640	800	1250	1250	1000	2000	1250	2500
	40	640	800	1250	1250		2000	1250	2500
	50	640	800	1250	1250		2000	1250	2500
	63		800	1250	1250		2000	1250	2500
TM-DC trip units	**80**			1250	1250		2000		2500
	100				1250		2000		2500
Compact NSX160 DC	**16**	640	800	1250	1250	1000	2000	1250	2500
TM-D trip units	**25**	640	800	1250	1250	1000	2000	1250	2500
	32	640	800	1250	1250	1000	2000	1250	2500
	40	640	800	1250	1250		2000	1250	2500
	50	640	800	1250	1250		2000	1250	2500
	63		800	1250	1250		2000	1250	2500
TM-DC trip units	**80**			1250	1250		2000		2500
	100				1250		2000		2500
	125						2000		2500
	160						2000		2500
Compact NSX250 DC	**80**				1250		2000	1250	2500
TM-DC trip units	**100**				1250		2000	1250	2500
	125						2000		2500
	160						2000		2500
	200 Irm min.						2000		2500
	200 Irm max.								2500
	250 Irm min.								2500
	250 Irm max.								

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Protection discrimination

Upstream: Compact NSX400-NSX630 DC
Downstream: Compact NSX100 to NSX630 DC

	pstream a netic trip unit d usta le m	NSX DC-NSX DC - a netic protection onl					
		in	ax	in	ax	in	ax
Downstream	**atin n**						
Compact NSX DC		800	1600	1250	2500	2000	4000
D trip units		800	1600	1250	2500	2000	4000
			1600	1250	2500	2000	4000
			1600	1250	2500	2000	4000
			1600	1250	2500	2000	4000
			1600	1250	2500	2000	4000
DC trip units			1600	1250	2500	2000	4000
			1600	1250	2500	2000	4000
Compact NSX DC		800	1600	1250	2500	2000	4000
D trip units		800	1600	1250	2500	2000	4000
			1600	1250	2500	2000	4000
			1600	1250	2500	2000	4000
			1600	1250	2500	2000	4000
			1600	1250	2500	2000	4000
DC trip units			1600	1250	2500	2000	4000
			1600	1250	2500	2000	4000
			1600		2500	2000	4000
			1600		2500	2000	4000
Compact NSX DC			1600	1250	2500	2000	4000
DC trip units			1600	1250	2500	2000	4000
			1600		2500	2000	4000
			1600		2500	2000	4000
	rm min				2500	2000	4000
	rm max						4000
	rm min				2500	2000	4000
	rm max						4000
Compact NSX DC-NSX DC	**rm min**				2500		4000
	rm max				2500		4000
	rm min						4000
	rm max						4000
Compact NSX DC	**rm min**						
	rm max						

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Protection discrimination

Upstream: Masterpact NW10 DC
Downstream: Compact NSX100 to NSX630 DC, Masterpact NW10 DC

	Upstream	Masterpact NW10 DC magnetic protection only									
	Magnetic trip unit	1250 A to 2500 A					2500 A to 5400 A				
	Adjustable	Setting					Setting				
		A	B	C	D	E	A	B	C	D	E
	Ii (A)	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
Downstream	**Rating In (A)**										
Compact NSX100 DC	**16**	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
TM-D trip units	**25**	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	32	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	40	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	50	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	63	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
TM-DC trip units	**80**	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	100	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
Compact NSX160 DC	**16**	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
TM-D trip units	**25**	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	32	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	40	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	50	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	63	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
TM-DC trip units	**80**	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	100	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	125				2000	2500	2500	3300	4000	5000	5400
	160				2000	2500	2500	3300	4000	5000	5400
Compact NSX250 DC	**80**	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
TM-DC trip units	**100**	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	125				2000	2500	2500	3300	4000	5000	5400
	160				2000	2500	2500	3300	4000	5000	5400
	200 Irm min.		1500	1600	2000	2500	2500	3300	4000	5000	5400
	200 Irm max.							3300	4000	5000	5400
	250 Irm min.				2000	2500	2500	3300	4000	5000	5400
	250 Irm max.							3300	4000	5000	5400
Compact NSX400 DC - NSX630 DC	**MP1 Irm min.**	1250	1500	1600	2000	2500	2500	3300	4000	5000	5400
	MP1 Irm max.					2500	2500	3300	4000	5000	5400
	MP2 Irm min.				2000	2500	2500	3300	4000	5000	5400
	MP2 Irm max.								4000	5000	5400
Compact NSX630 DC	**MP3 Irm min.**							3300	4000	5000	5400
	MP3 Irm max.										
Masterpact NW10 DC Ii = 1250/2500 A	**Setting A**			1600	2000	2500	2500	3300	4000	5000	5400
	B				2000	2500	2500	3300	4000	5000	5400
	C				2000	2500	2500	3300	4000	5000	5400
	D					2500	2500	3300	4000	5000	5400
	E							3300	4000	5000	5400
Masterpact NW10 DC Ii = 2500/5400 A	**Setting A**							3300	4000	5000	5400
	B									5000	5400
	C									5000	5400
	D										
	E										

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Protection discrimination

Upstream: Masterpact NW10 DC and NW20 DC
Downstream: Compact NSX100 to NSX630 DC, Masterpact NW10 DC and NW20 DC

	Upstream	Masterpact NW10 DC - Masterpact NW20 DC magnetic protection only									
	Magnetic trip unit	5000 A to 11000 A					2500 A to 5400 A				
	Adjustable	Setting					Setting				
		A	B	C	D	E	A	B	C	D	E
	Ii (A)	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
Downstream	**Rating In (A)**										
Compact NSX100 DC	**16**	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
TM-D trip units	**25**	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	32	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	40	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	50	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	63	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
TM-DC trip units	**80**	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	100	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
Compact NSX160 DC	**16**	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
TM-D trip units	**25**	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	32	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	40	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	50	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	63	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
TM-DC trip units	**80**	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	100	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	125	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	160	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
Compact NSX250 DC	**80**	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
TM-DC trip units	**100**	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	125	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	160	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	200 Irm min.	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	200 Irm max.	5000	8000	10000	11000	11000		3300	4000	5000	5400
	250 Irm min.	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	250 Irm max.	5000	8000	10000	11000	11000		3300	4000	5000	5400
Compact NSX400 DC-NSX630 DC	**MP1 Irm min.**	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	MP1 Irm max.	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	MP2 Irm min.	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	MP2 Irm max.	5000	8000	10000	11000	11000			4000	5000	5400
Compact NSX630 DC	**MP3 Irm min.**	5000	8000	10000	11000	11000		3300	4000	5000	5400
	MP3 Irm max.		8000	10000	11000	11000					
Masterpact NW10 DC Ii = 1250/2500 A	**Setting A**	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	B	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	C	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	D	5000	8000	10000	11000	11000	2500	3300	4000	5000	5400
	E	5000	8000	10000	11000	11000		3300	4000	5000	5400
Masterpact NW10 DC Ii = 2500/5400 A	**Setting A**	5000	8000	10000	11000	11000		3300	4000	5000	5400
	B	5000	8000	10000	11000	11000				5000	5400
	C	5000	8000	10000	11000	11000				5000	5400
	D		8000	10000	11000	11000					
	E		8000	10000	11000	11000					
Masterpact NW10 DC Ii = 5000/11000 A	**Setting A**		8000	10000	11000	11000					
	B			10000	11000	11000					
	C										
	D										
	E										
Masterpact NW20 DC Ii = 2500/5400 A	**Setting A**							3300	4000	5000	5400
	B									5000	5400
	C									5000	5400
	D										
	E										

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Protection discrimination

Upstream: Masterpact NW20 DC and NW40 DC
Downstream: Compact NSX100 to NSX630 DC, Masterpact NW10 to NW40 DC

	Upstream	Masterpact NW20 DC - Masterpact NW40 DC magnetic protection only									
	Magnetic trip unit	5000 A to 11000 A					5000 A to 11000 A				
	Adjustable	Setting					Setting				
		A	B	C	D	E	A	B	C	D	E
	Ii (A)	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
Downstream	**Rating In (A)**										
Compact NSX100 DC	**16**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
TM-D trip units	**25**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	32	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	40	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	50	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	63	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
TM-DC trip units	**80**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	100	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
Compact NSX160 DC	**16**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
TM-D trip units	**25**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	32	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	40	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	50	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	63	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
TM-DC trip units	**80**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	100	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	125	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	160	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
Compact NSX250 DC	**80**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
TM-DC trip units	**100**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	125	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	160	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	200 Irm min.	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	200 Irm max.	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	250 Irm min.	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	250 Irm max.	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
Compact NSX400 DC-NSX630 DC	**MP1 Irm min.**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	MP1 Irm max.	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	MP2 Irm min.	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	MP2 Irm max.	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
Compact NSX630 DC	**MP3 Irm min.**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	MP3 Irm max.		8000	10000	11000	11000		8000	10000	11000	11000
Masterpact NW10 DC Ii = 1250/2500 A	**Setting A**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	B	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	C	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	D	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	E	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
Masterpact NW10 DC Ii = 2500/5400 A	**Setting A**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	B	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	C	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	D		8000	10000	11000	11000	5000	8000	10000	11000	11000
	E		8000	10000	11000	11000	5000	8000	10000	11000	11000
Masterpact NW10 DC Ii = 5000/11000 A	**Setting A**		8000	10000	11000	11000	5000	8000	10000	11000	11000
	B			10000	11000	11000	5000	8000	10000	11000	11000
	C										
	D										
	E										
Masterpact NW20 DC Ii = 2500/5400 A	**Setting A**	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	B	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	C	5000	8000	10000	11000	11000	5000	8000	10000	11000	11000
	D		8000	10000	11000	11000	5000	8000	10000	11000	11000
	E		8000	10000	11000	11000	5000	8000	10000	11000	11000
Masterpact NW20 DC Ii = 5000/11000 A	**Setting A**		8000	10000	11000	11000	5000	8000	10000	11000	11000
	B			10000	11000	11000	5000	8000	10000	11000	11000
	C										
	D										
	E										
Masterpact NW40 DC Ii = 5000/11000 A	**Setting A**						5000	8000	10000	11000	11000
	B						5000	8000	10000	11000	11000
	C										
	D										
	E										

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Catalogue numbers and order form

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Functions and characteristics A-1
Installation recommendations B-1
Dimensions and connection C-1
Electrical diagrams D-1
Additional characteristics E-1

Compact NSX100 DC to NSX630 DC for direct current
Choice of device F-2
Parallel or series connection accessories F-3
Connection accessories F-4
Electrical auxiliaries F-5
Operation and locking/Interlocking F-7
Installation F-8
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Spare parts: Compact NSX100 DC to NSX630 DC for direct current **F-10**

Spare parts: Masterpact NW DC
Connection F-11
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Spare parts: Masterpact NW DC Monitoring and control converter **F-19**

Order form: Compact NSX100 DC to NSX630 DC **F-20**

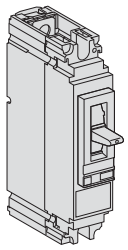
Order form: Masterpact NW DC **F-21**

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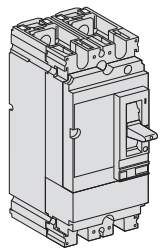
Compact NSX100 DC to NSX630 DC for direct current
Choice of device

Compact NSX F N

ith thermal-ma netic trip unit T -D


DB404343.eps

Compact NSX F C DC		Compact NSX F C DC	
atin	d cu DC	d cu DC - DC	
16D			
20D			
25D			
30D			
40D			
50D			
63D			
80D			
100D			
Compact NSX F C DC		**Compact NSX F C DC**	
atin	d cu DC	d cu DC - DC	
125D			
160D			

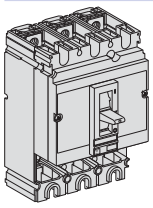

DB404344.eps

Compact NSX N C DC		Compact NSX C DC	
atin	d cu DC	d cu DC - DC	
16D			
20D			
25D			
30D			
40D			
50D			
63D			
80D			
100D			
Compact NSX N C DC		**Compact NSX C DC**	
atin	d cu DC	d cu DC - DC	
125D			
160D			

Compact NSX C DC		Compact NSX S C DC	
atin	d cu DC	d cu DC - DC	
16D			
20D			
25D			
30D			
40D			
50D			
63D			
80D			
100D			
Compact NSX C DC		**Compact NSX S C DC**	
atin	d cu DC	d cu DC - DC	
125D			
160D			

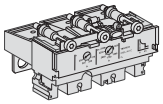
Compact NSX DC

asic frame


DB115910.eps

atin	cu DC - DC - DC
NSX100 DC	
NSX160 DC	
NSX250 DC	
	cu DC - DC - DC
NSX100S DC	
NSX160S DC	
NSX250S DC	

Trip unit


DB404345.eps

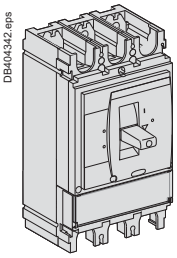
Standard protection trip unit T -D DC			
atin	d	d	
16D			
25D			
32D			
40D			
50D			
63D			
80DC			
100DC			
125DC			
160DC			
200DC			
250DC			
T pe protection trip unit T -			
atin	d	d	
16			
25			
40			
63			

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Compact NSX100 DC to NSX630 DC for direct current

Choice of device (cont.)
Parallel or series connection accessories

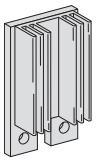
Compact NSX400/630 DC with trip unit MP


DB404342.eps

	3P	4P
Trip unit MP1		
Compact NSX400F DC (36kA)	**LV438403**	**LV438408**
Compact NSX400S DC (100kA)	**LV438418**	**LV438419**
Compact NSX630F DC, 45 mm pitch (36kA)	**LV438503**	**LV438508**
Compact NSX630S DC, 45 mm pitch (100kA)	**LV438518**	**LV438519**
Trip unit MP2		
Compact NSX400S DC (100kA)	**LV438428**	**LV438429**
Compact NSX630S DC, 45 mm pitch (100kA)	**LV438528**	**LV438529**
Trip unit MP3		
Compact NSX630S DC, 45 mm pitch (100kA)	**LV438538**	**LV438539**

Special connection accessories for parallel or series connection


DB104731.eps





			NSX100-250 DC	NSX400-630 DC
Connection accessories				
Connection accessories for parallel or series connection of 2 poles (1)	1 connection plate equipped with heat sink + 1 interphase barrier (2)		**LV438328**	**LV438338**
Connection plates				
Connection plates for parallel connection of 3 poles	1 set of 2 connection plates		**LV438329**	(3)
Connection plates for parallel connection of 4 poles			(3)	(3)
1P short terminal shields	1 pair		**LV438320**	
2P short terminal shields	2 pairs	2 x	**LV438320**	
3P terminal shields for series connection of poles	1 set		**LV438325**	**LV438345**
4P terminal shields for series connection of poles	1 set		**LV438326**	**LV438346**
4P terminal shields for parallel connection of poles (2P/4P)	1 set		**LV438327**	**LV438337**

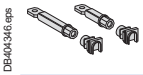
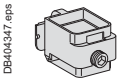
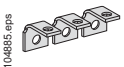
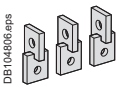
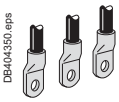
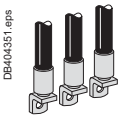
(1) Series connection: 2 poles = 1 connection plate.
3 poles = 2 connection plates.
4 poles = 3 connection plates.
Parallel connection: 2 poles = 2 connection plates.
3 poles = 1 set of 2 connection plates (29499).
2 x 2 poles = 4 connection plates.

(2) These connection accessories come with an interphase barrier.

(3) To be made by the customer.

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Compact NSX100 DC to NSX630 DC for direct current
Connection accessories

Connection accessories (Cu or Al)				NSX100-250 DC	NSX400-630 DC
Rear connections					
 DB404346.eps	2 short			LV429235	LV432475
	2 long			LV429236	LV432476
Cable connectors					
 DB404347.eps	Snap-on, for cable:	1.5 to 95 mm² ; ⩽ 160 A	Set of 2	LV429246	
			Set of 3	LV429242	
			Set of 4	LV429243	
		25 to 95 mm² ; ⩽ 250 A	Set of 2	LV429255	
			Set of 3	LV429227	
			Set of 4	LV429228	
		120 to 185 mm² ; ⩽ 250 A	Set of 2	LV429247	
			Set of 3	LV429259	
			Set of 4	LV429260	
 DB404348.eps	For 1 cable from 35 to 300 mm²		Set of 3		LV432479
			Set of 4		LV432480
	For 2 cables from 35 to 240 mm²		Set of 3		LV432481
			Set of 4		LV432482
 DB404349.eps	Voltage measurement input for cable connector 185 mm² or 1 x 300 mm² or 2 x 240 mm²		Set of 2	LV429348	LV429348
Terminal extensions					
 DB104885.eps	Right-angle terminal extensions		Set of 2	LV429250	
			Set of 3	LV429261	LV432484
			Set of 4	LV429262	LV432485
 DB104884.eps	Straight terminal extensions		Set of 2	LV429251	
			Set of 3	LV429263	
			Set of 4	LV429264	
 DB104806.eps	Edgewise pads		Set of 3		LV432486
			Set of 4		LV432487
Crimp lugs for copper cable (supplied with 2 or 3 interphase barriers)					
 DB404350.eps	For cable 120 mm²		Set of 3	LV429252	
			Set of 4	LV429256	
	For cable 150 mm²		Set of 3	LV429253	
			Set of 4	LV429257	
	For cable 185 mm²		Set of 3	LV429254	
			Set of 4	LV429258	
	For cable 240 mm²		Set of 3		LV432500
			Set of 4		LV432501
	For cable 300 mm²		Set of 3		LV432502
			Set of 4		LV432503
Crimp lugs for aluminium cable (supplied with 2 or 3 interphase barriers)					
 DB404351.eps	For cable 150 mm²		Set of 3	LV429504	
			Set of 4	LV429505	
	For cable 185 mm²		Set of 3	LV429506	
			Set of 4	LV429507	
	For cable 240 mm²		Set of 3		LV432504
			Set of 4		LV432505
	For cable 300 mm²		Set of 3		LV432506
			Set of 4		LV432507
Barriers					
 DB115920.eps	Interphase barriers		Set of 6	LV429329	LV432570

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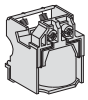
Compact NSX100 DC to NSX630 DC for direct current
Electrical auxiliaries

Electrical auxiliaries

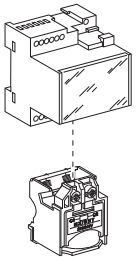
uxiliar contacts chan eover


DB404352.eps

O or SD or SD or SD			
O or SD or SD or SD low level			
SD adapter, mandatory for trip unit			


DB404353.eps

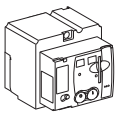
olta e releases		X	N
C	24 50/60 z		
	48 50/60 z		
	110 130 50/60 z		
	220 240 50/60 z 208 277 60 z		
	380 415 50 z 440 480 60 z		
	525 50 z 600 60 z		
DC	12		
	24		
	30		
	48		
	60		
	125		
	250		


DB115631.eps

MN 48 V 50/60 Hz with fixed time delay		
Composed of	N 48 DC	
	Delay unit 48 50/60 z	
MN 220-240 V 50/60 Hz with fixed time delay		
Composed of	N 250 DC	
	Delay unit of 220 240 50/60 z	
MN 48 V DC/AC 50/60 Hz with adjustable time delay		
Composed of	N 48 DC	
	Delay unit 48 50/60 z	
MN110-130 V DC/AC 50/60 Hz with adjustable time delay		
Composed of	N 125 DC	
	Delay unit 110 130 50/60 z	
MN 220-250 V 50/60 Hz with adjustable time delay		
Composed of	N 250 DC	
	Delay unit of 220 240 50/60 z	

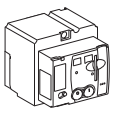
Motor mechanism

Motor mechanism module supplied with SDE adapter

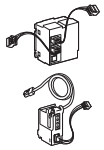

DB112265.eps

	olta e	T	T	T -
C	48 60 50/60 z			
	110 130 50/60 z			
	220 240 50/60 z 208 277 60 z			
	380 415 50/60 z 440 480 60 z			
DC	24 30			
	48 60			
	110 130			
	250			
Operations counter				

Communicating motor mechanism module supplied with SDE adapter


DB112265.eps

otor mechanism module	c 100/160	220 240 50/60 z	
	c 250	220 240 50/60 z	
Breaker and Status Communication odule	BSC		



NSX cord	Wire length 0.35 m	
	Wire length 1.3 m	
	Wire length 3 m	
	480 C wire length 0.35 m	

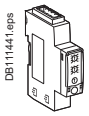
(1) S only

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Compact NSX100 DC to NSX630 DC for direct current
Electrical auxiliaries (cont.)

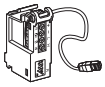
Communication accessories (1)

ULP communication module


DB111441.eps

Modbus interface	Modbus SL communication interface module	**TRV00210**

ULP wiring accessories


DB111442.eps

NSX cord L = 0.35 m	**LV434200**
NSX cord L = 1.3 m	**LV434201**
NSX cord L = 3 m	**LV434202**
NSX cord for U > 480 V AC L = 1.3 m	**LV434204**


DB115621.eps

10 stacking connectors for communication interface modules	**TRV00217**


DB111443.eps

2 Modbus line terminators	**VW3A8306DRC** (2)


DB115622.eps

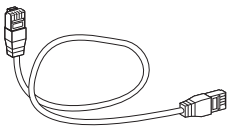
RS 485 roll cable (4 wires, length 60 m)	**50965**


DB115623.eps

5 RJ45 connectors female/female	**TRV00870**

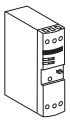

DB111444.eps

10 ULP line terminators	**TRV00880**

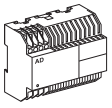

DB111445.eps

10 RJ45/RJ45 male cord L = 0.3 m	**TRV00803**
10 RJ45/RJ45 male cord L = 0.6 m	**TRV00806**
5 RJ45/RJ45 male cord L = 1 m	**TRV00810**
5 RJ45/RJ45 male cord L = 2 m	**TRV00820**
5 RJ45/RJ45 male cord L = 3 m	**TRV00830**
1 RJ45/RJ45 male cord L = 5 m	**TRV00850**
2 wires RS 485 insulated repeated	**TRV00211**

Power supply modules


DB122278.eps

External power supply module 100-240 V AC 110-230 V DC / 24 V DC-3 A class 2	**ABL8RPS24030** (3)


DB122736.eps

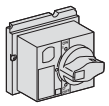
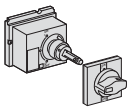
External power supply module 24 V DC-1 A OVC IV	
24-30 V DC	**54440**
48-60 V DC	**54441**
100-125 V AC	**54442**
110-130 V AC	**54443**
200-240 V AC	**54444**
380-415 V AC	**54445**

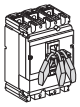
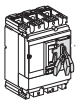
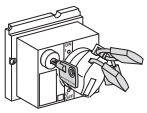
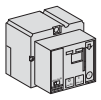
(1) NSX100-250 DC only.
(2) SDE adapter mandatory for trip unit TM,TMG.
(3) See Telemecanique catalogue.

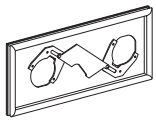
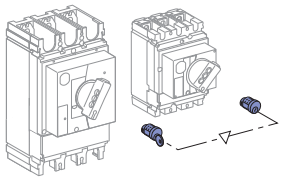
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Compact NSX100 DC to NSX630 DC for direct current

Operation and locking/Interlocking

Rotary handles		NSX100-250 DC	NSX400-630 DC
Direct rotary handles			
 DB115918.eps	With black handle	LV429337	LV432597
	With red handle on yellow front	LV429339	LV432599
	MCC conversion accessory	LV429341	LV432606
	CNOMO conversion accessory	LV429342	LV432602
Extended rotary handle			
 DB115917.eps	With black handle	LV429338	LV432598
	With red handle on yellow front	LV429340	LV432600
	With telescopic handle for withdrawable device	LV429343	LV432603
Accessories			
	Indication auxiliary — 1 early-break contact	LV429345	LV432605
	Indication auxiliary — 2 early-break contacts	LV429346	LV429346

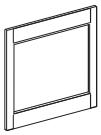
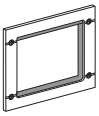
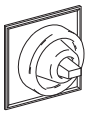
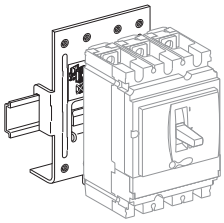
Locks		NSX100-250 DC	NSX400-630 DC
Toggle locking device for 1 to 3 padlocks			
 DB115913.eps	By removable device	29370	29370
 DB115916.eps	By fixed device	LV429371	LV432631
Locking of the rotary handle			
 DB115914.eps	Keylock adapter (keylock not included)	LV429344	LV432604
	Keylock (keylock adapter not included) — Ronis 1351B.500	41940	41940
	Keylock (keylock adapter not included) — Profalux KS5 B24 D4Z	42888	42888
Locking of the motor mechanism modules			
 DB115919.eps	Keylock adapter + Ronis keylock (special)	LV429449	LV432649
	Keylock (keylock adapter not included) — Ronis 1351B.500		41940
	Keylock (keylock adapter not included) — Profalux KS5 B24 D4Z		42888

Interlocking		NSX 100-250	NSX 400-630
Mechanical interlocking for circuit breakers			
 DB111486.eps	With toggles	LV429354	LV432614
 DB111487.eps	With rotary handles	LV429369	LV432621
Interlocking with key (2 keylocks / 1 key) for rotary handles			
 DB122268.eps	Keylock kit (keylock not included) [1]	LV429344	LV432604
	1 set of 2 keylocks — Ronis 1351B.500	41950	41950
	(1 key only, keylock kit not included) — Profalux KS5 B24 D4Z	42878	42878

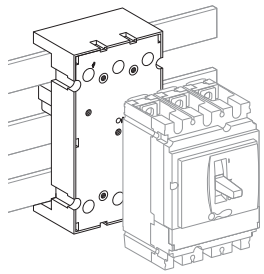
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Compact NSX100 DC to NSX630 DC for direct current
Installation

Installation accessories

Front-panel escutcheons		NSX 100-250	NSX 400-630
 DB112269.eps	IP30 escutcheon for all control types	LV429525	LV432557
	IP30 trip unit access escutcheon for toggle	LV429526	LV432559
IP30			
 DB112737.eps	IP40 escutcheon for all control types	LV429317	LV432558
IP40			
IP43 rubber toggle cover			
 DB112738.eps	1 toggle cover	LV429319	LV432560
Lead-sealing accessories			
 DB115615.eps	Bag of accessories	LV429375	LV429375
Din rail adapter			
 DB112739.eps	1 adapter	LV429305	

60 mm plate busbar adapter

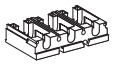
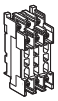
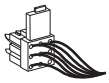
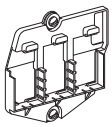
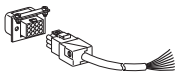
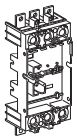
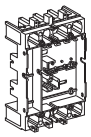
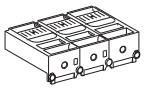
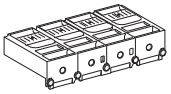
 DB111428.eps	3P 60 mm busbar adapter	LV429372	LV432623
	4P 60 mm busbar adapter	LV429373	LV432624

(1) For only 1 device.

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Compact NSX100 DC to NSX630 DC for direct current
Plug-in/withdrawable accessories

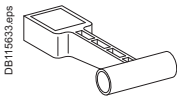
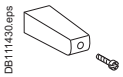
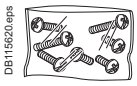
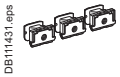
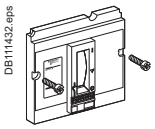
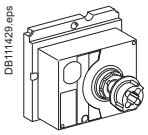
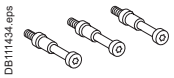
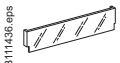
Plug-in/withdrawable version accessories

			NSX 100-250	NSX 400-630
Insulation accessories				
 DB117159.eps	1 connection adapter for plug-in base	3P	LV429306	LV432584
		4P	LV429307	LV432585
Auxiliary connections				
 DB117160.eps	1 9-wire fixed connector (for base)		LV429273	LV429273
 DB117161.eps	1 9-wire moving connector (for circuit breaker)		LV429274	LV432523
 DB116368.eps	1 support for 2 moving connectors		LV429275	LV432525
 DB115885.eps	9-wire manual auxiliary connector (fixed + moving)		LV429272	LV429272
Plug-in base accessories				
 DB117164.eps	2 long insulated right angle terminal extensions	Set of 2	LV429276	LV432526
 DB117165.eps	2 IP40 shutters for base		LV429271	LV432521
 DB117180.eps	Base	2P	LV429265	
		3P	LV429266	LV432516
 DB117181.eps	Base	4P	LV429267	LV432517
 DB117182.eps	2 power connections	2/3/4P	LV429268	LV432518
 DB117183.eps	1 short terminal shields	2/3P	LV429515	LV432591
 DB117184.eps	1 short terminal shields	4P	LV429516	LV432592
 DB117171.eps	1 safety trip interlock	2/3/4P	LV429270	LV432520
Installation and connection				
	Kit for Compact	3P	LV429289 + LV429282 + LV429283	LV422538 + LV422532 + LV422533
		4P	LV429290 + LV429282 + LV429283	LV422539 + LV422532 + LV422533

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Spare parts: Compact NSX100 DC to NSX630 DC for direct current

Spare parts

			NSX 100-250	NSX 400-630
 DB115633.eps	Additional toggle extension for NSX400/630			32595
 DB111430.eps	10 spare toggle extensions (NSX250)		LV429313	
	5 spare toggle extensions			LV432553
 DB115620.eps	Bag of screws		LV429312	LV432552
 DB111431.eps	12 snap-in nuts (fixed/FC)	M6 for NSX100N/H/L	LV429234	
		M8 for NSX160/250N/H/L	LV430554	
 DB111432.eps	NS retrofit escutcheon	Small cut-out	LV429528	LV432571
 DB111433.eps	IP40 toggle escutcheon	Compact NS type/small cut-out	29315	32556
 DB111438.eps	1 set of 10 identification labels		LV429226	LV429226
 DB111429.eps	1 base for extended rotary handle		LV429502	LV432498
 DB111434.eps	Torque limiting screws (set of 12)	3P/4P Compact NSX100-630	LV429513	LV432513
 DB111436.eps	5 transparent covers for trip unit	TM, MA, NA	LV429481	

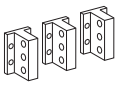
For reference only. www.fengshengelectric.com.sg

Spare parts: Masterpact NW DC
Connection

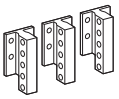
Connection

		C or D type	E type
Fixed or drawout circuit breakers or switches			
Rear connection (vertical or horizontal mounting) / Replacement kit (3 or 4 parts)			
1000/2000 A	Vertical or horizontal Top or bottom	**47966**	**47967**
4000 A	Vertical or horizontal Top or bottom	**47968**	**47969**

DB404366.eps



DB413008.eps

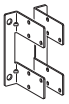


Vertical mounting

Connection accessories

Additional support brackets for mounting on a backplate		
For fixed rear-connected circuit breaker (2 parts)		**47829**

DB404369.eps

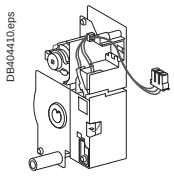


For reference only. www.fengshengelectric.com.sg

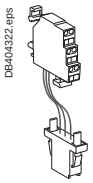
Spare parts: Masterpact NW DC
Remote operation

emote operation

ear motor



C part		
C 50/60 z	48	
	100/130	
	200/240	
	250/277	
	380/415	
	440/480	
DC	24/30	
	48/60	
	100/125	
	200/250	
erminal block 1 part	For fixed circuit breaker	
	For drawout circuit breaker	

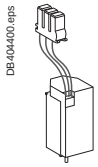




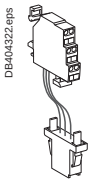
i e *ra out*

Installation manual		

Closin and openin release XF or X



Standard coil part		
C 50/60 z	12 DC	
DC	24/30 DC, 24 C	
	48/60 DC, 48 C	
	100/130 C/DC	
	200/250 C/DC	
	277 C	
	380/480 C	
Communicatin coil part		
C 50/60 z	12 DC	
DC	24/30 DC, 24 C	
	48/60 DC, 48 C	
	100/130 C/DC	
	200/250 C/DC	
	277 C	
	380/480 C	
erminal block 1 part	For fixed circuit breaker	
	For drawout circuit breaker	

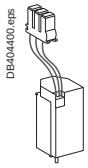




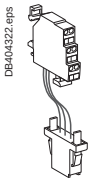
i e *ra out*

Installation manual		

ndervolta e release N



ndervolta e release part		
C 50/60 z	24/30 DC, 24 C	
DC	48/60 DC, 48 C	
	100/130 C/DC	
	200/250 C/DC	
	380/480 C	
erminal block 1 part	For fixed circuit breaker	
	For drawout circuit breaker	

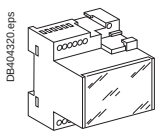




i e *ra out*

Installation manual		

N dela unit



N dela unit part			
		(non-adjustable)	r (adjustable)
C 50/60 z	48/60 C/DC		
DC	100/130 C/DC		
	200/250 C/DC		
	380/480 C/DC		
Installation manual			

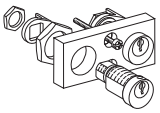
For reference only. www.fengshengelectric.com.sg

Spare parts: Masterpact NW DC
Chassis locking and accessories

Chassis locking

"Disconnected" position locking / 1 part

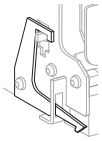
DB404325.eps



By padlocks		
	VCPO	Standard
By Profalux keylocks		
Profalux	1 lock with 1 key + adaptation kit	**64934**
	2 locks 1 key + adaptation kit	**64935**
	2 locks 2 different keys + adaptation kit	**64936**
1 keylock Profalux (without adaptation kit):	identical key not identified combination	**33173**
	identical key identified 215470 combination	**33174**
	identical key identified 215471 combination	**33175**
By Ronis keylocks		
Ronis	1 lock with 1 key + adaptation kit	**64937**
	2 locks 1 key + adaptation kit	**64938**
	2 locks 2 different keys + adaptation kit	**64939**
1 keylock Ronis (without adaptation kit):	identical key not identified combination	**33189**
	identical key identified EL24135 combination	**33190**
	identical key identified EL24153 combination	**33191**
	identical key identified EL24315 combination	**33192**
Adaptation kit (without keylock):	adaptation kit Profalux / Ronis	**48564**
	adaptation kit Kirk	**48565**
	adaptation kit Castell	**48566**
Installation manual		**47952**

Door interlock / 1 part

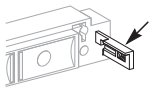
DB404326.eps



Right and left-hand side of chassis (VPECD or VPECG)	**47914**
Installation manual	**47952**

Racking interlock

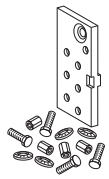
DB404327.eps



5 parts	**64940**
Installation manual	**47952**

Breaker mismatch protection / 1 part

DB404329.eps

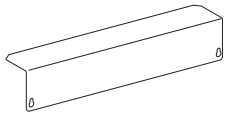


Breaker mismatch protection (VDC)	**33767**
Installation manual	**47952**

Chassis accessories

Auxiliary terminal shield (CB) / 1 part

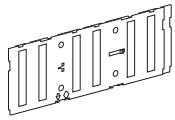
DB404331.eps



800/4000 A	3P	**64942**
	4P	**48596**
4000b/6300 A	3P	**48597**
	4P	**48598**

Safety shutters + locking block / 1 part

DB404332.eps



800/4000 A	3P	**48721**
	4P	**48723**
4000b/6300 A	3P	**48722**
	4P	**48724**
Installation manual		**47952**

Shutter locking block (for replacement) / 1 part

DB404333.eps



2 parts for 800/4000 A	**48591**
Installation manual	**47952**

Earthing kit for chassis

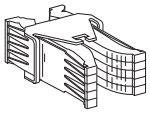
	3P	4P
Types for N1/H1/NA/HA		
	48433	**48434**

Note: *the installation manual is enclosed.*

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Spare parts: Masterpact NW DC
Clusters

Clusters



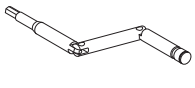
1 disconnecting contact cluster for chassis (see table below) (part 1) — **64906**

Table : number of clusters required for the different chassis models

Chassis rating (A)	Masterpact NW 3P				Masterpact NW 4P			
	N1	H1/H2	H3	L1	N1	H1/H2	H3	L1
250		12 (H1)						
630	6	12		24	8	16		32
800	6	12		24	8	16		32
1000	6	12		24	8	16		32
1250	6	12		24	8	16		32
1600	12	12		24	16	16		32
2000		24	24	42		32	32	56
2500		24	24			32	32	
3200		36	36			48	48	
4000		42	42			56	56	
4000b		72				96		
5000		72				96		
6300		72				96		

Note: *the minimum order is 6 parts.*

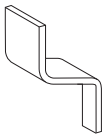
Racking handle



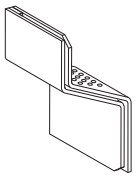
Racking handle — **47944**

DC rear connection

Serial connection kit



For NW10/20 DC — **48642**



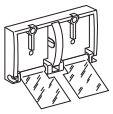
For NW40 DC — **48643**

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Spare parts: Masterpact NW DC
Circuit breaker locking and accessories

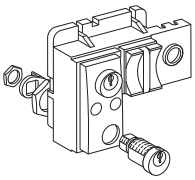
Circuit breaker locking

Pushbutton locking device / 1 part


DB404337.eps

By padlocks		48536
Installation manual		47951

OFF position locking / 1 part


DB404411.eps

By padlocks		
		48539
By Profalux keylocks		
Profalux	1 lock with 1 key + adaptation kit	64928
	2 locks 1 key + adaptation kit	64929
	2 locks 2 different keys + adaptation kit	64930
1 keylock Profalux (without adaptation kit):	identical key not identified combination	33173
	identical key identified 215470 combination	33174
	identical key identified 215471 combination	33175
By Ronis keylocks		
Ronis	1 lock with 1 key + adaptation kit	64931
	2 locks 1 key + adaptation kit	64932
	2 locks 2 different keys + adaptation kit	64933
1 keylock Ronis (without adaptation kit):	identical key not identified combination	33189
	identical key identified EL24135 combination	33190
	identical key identified EL24153 combination	33191
	identical key identified EL24315 combination	33192
Adaptation kit (without keylock):	adaptation kit Profalux / Ronis	64925
	adaptation kit Kirk	64927
	adaptation kit Castell	64926
Installation manual		47951

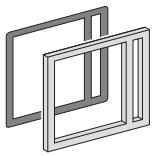
Other circuit breaker accessories

Mechanical operation counter / 1 part

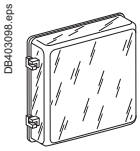

DB125617.eps

Operation counter CDM	48535
Installation manual	47951

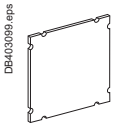
Escutcheon and accessories / 1 part


DB403097.eps

Escutcheon


DB403098.eps

Cover


DB403099.eps

Blanking plate

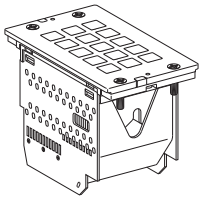
	Fixed	Drawout
Escutcheon	48601	48603
Transparent cover (IP 54)		48604
Escutcheon blanking plate	48605	48605
Installation manual		47951

Spring charging handle / 1 part


DB404413.eps

Spring charging handle	47940
Installation manual	47951

Arc chute for Masterpact NW / 1 part


DB404414.eps

		C type		D type		E type
Type NW DC	2 x	47934	3 x	47934	4 x	47934
Installation manual						47951

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Spare parts: Masterpact NW DC
Mechanical interlocking for source changeover

Cable-type door interlock

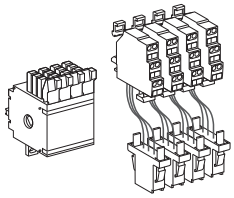
1 complete assembly for Masterpact NW fixed or drawout device ***Note:*** *the installation manual is enclosed.*	**48614**

For reference only. www.fengshengelectric.com.sg

Spare parts: Masterpact NW DC
Indication contacts

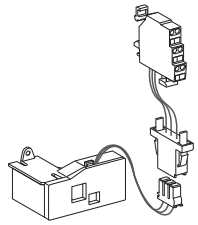
Indication contacts

ON/OFF indication contacts (OF) / 12 parts


DB404321.eps

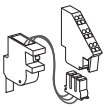
1 additional block of 4 contacts		64922
Wiring	For fixed circuit breaker	47074
	For drawout circuit breaker	47849
Installation manual		47951

"Fault trip" indication contacts (SDE) / 1 part


DB404323.eps

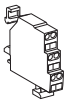
Changeover contact (SDE)	6 A - 240 V	47915
	Low-level	47916
Wiring	For fixed circuit breaker	47074
	For drawout circuit breaker	47849
Installation manual		47951

"Ready to close" contact (1 max.) / 1 part


DB404415.eps

		PF
1 changeover contact (5 A - 240 V)		47080
1 low-level changeover contact		47081
Wiring	For fixed circuit breaker	47074
	For drawout circuit breaker	47849
Installation manual		47951

"Connected, disconnected, test position" indication contact (carriage switches) / 1 part

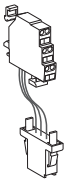

DB404324.eps

Changeover contacts	6 A - 240 V	33170
CE, CD, CT	Low-level	33171
Installation manual		47952

Set of additional actuaters for carriage switches / 1 set

1 set	48560

Combined closed / connected contacts for use with 1 auxiliary contact / 1 part


DB404322.eps

1 contact (5 A - 240 V)	48477
or 1 low-level contact	48478
Installation manual	47952

Electrical closing pushbutton / 1 part


DB404319.eps

	BPFE
1 pushbutton	48534
Installation manual	47951

Auxiliary terminals for chassis alone

3 wire terminal (1 part)	47849
6 wire terminal (1 part)	47850
Jumpers (10 parts)	47900

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Spare parts: Masterpact NW DC
Instructions

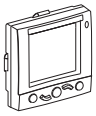
Instructions		
Chassis accessories		**47952**
Circuit breaker accessories		**47951**
Fixed and drawout circuit breaker		**47950**
User manual	NW DC (French)	**64923**
	NW DC (English)	**64924**
Modbus communication notice for manual		**33088**

For reference only. www.fengshengelectric.com.sg

Spare parts: Masterpact NW DC Monitoring and control converter

Monitoring and control

ULP display module


DB111440.eps

Switchboard front display module FDM121	**TRV00121**
FDM mounting accessory (diameter 22 mm)	**TRV00128**

ULP wiring accessories


DB127985.eps

Breaker ULP cord L = 0.35 m	**LV434195**
Breaker ULP cord L = 1.3 m	**LV434196**
Breaker ULP cord L = 3 m	**LV434197**


DB111443.eps

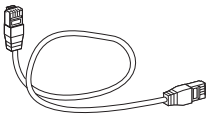
10 Modbus line terminators	**VW3A8306DRC** (1)


DB115623.eps

5 RJ45 connectors female/female	**TRV00870**


DB111444

10 ULP line terminators	**TRV00880**


DB111445.eps

10 RJ45/RJ45 male cord L = 0.3 m	**TRV00803**
10 RJ45/RJ45 male cord L = 0.6 m	**TRV00806**
5 RJ45/RJ45 male cord L = 1 m	**TRV00810**
5 RJ45/RJ45 male cord L = 2 m	**TRV00820**
5 RJ45/RJ45 male cord L = 3 m	**TRV00830**
1 RJ45/RJ45 male cord L = 5 m	**TRV00850**

Converter

RS485/Ethernet	**EGX100MG/EGX300** (*)

(1) See Telemecanique catalogue.
(*) Consult us.

For reference only. www.fengshengelectric.com.sg

Order form: Compact NSX100 DC to NSX630 DC

Check the applicable square bo es ☐ and enter the appropriate information in the rectangles

Circuit rea er — uantit

Compact type	NSX	
	NSX	
ating		
Circuit breaker	N	
Number of poles	or	
Circuit breaker	DC	
Number of poles	or	
Number of poles tripped	d or d	
i ed device	ront conn. ☐	ong rear conn. ☐
	Short rear conn. ☐	
lug in/withdr.	lug in ☐	Withdrawable ☐

Thermal-ma netic trip unit

Thermal-ma netic NSX to	**T D** rating 16 63	
	T rating 16 63	
	T DC rating 80 250	
a netic onl NSX	NSX400/630	
	NSX400/630	
	NSX630	

Special connection accessories for parallel or series connection

Series connection	2 poles 1 connection plate	
	3 poles 2 connection plates	
	4 poles 3 connection plates	
arallel connection	2 poles 2 connection plates	
	3 poles NSX100 to 250, 1 set of 2 connection plates	
	2 2 poles 4 connection plates	

Special terminal shields for parallel or series connection

1 short	1 pair	
2 short	2 1 pair 1	
3 short for series connection of poles	1 set	
4 short for series connection of poles	1 set	
4 short for parallel connection of poles 2 /4	1 set	

Connection

NSX100/250 connectors	Snap on 1.5□ to 95□ 160		
	Snap on 25□ to 95□ 250		
	Snap on 120□ to 185□ 250		
NSX400/630 connectors	1 cable 35□ to 300□		
	2 cables 35□ to 240□		
oltage measurement input	or bare cable connector	NSX100/250 ⩽ 185□	
	or bare cable connector	NSX400/630	
ight angle terminal e tensions			
Straight e tensions	NSX100/250		
dgewise e tensions	NSX400/630		
Cu cable lugs	NSX100/250 120□	150□	185□
	NSX400/630	240□	300□
l cable lugs	NSX100/250	150□	185□
	NSX400/630	240□	300□
Interface barriers			Set of 6

ndication and measurements

u iliary contact O , SD or SD				Standard ☐	ow level ☐	
SD adapter trip unit						☐

emote operation

lectrical operation	otor mechanism		C ☐	DC ☐		☐
oltage releases	Instantaneous	X	C ☐	DC ☐		☐
		N	C ☐	DC ☐		☐
	i ed time delay	N	C ☐	DC ☐		☐
	d ust. time delay	N	C ☐	DC ☐		☐

otar handles

Direct	Black ☐	ed on yellow front	☐
	CC conversion access. ☐	CNO O conversion access.	☐
tended	Black ☐	ed on yellow front	☐
	elescopic handle for withdrawable device		☐
Indication au iliary	1 early break switch ☐	2 early break switches	☐
	Wiring accessory for early make switches		☐

oc in

oggle 1 to 3 padlocks	emovable ☐	i ed	☐
otary handle	eylock adapter keylock not included		☐
	eylock onis 1351B.500 ☐	rofalu S5 B24 D4	☐
otor mechanism	eylock adapter eylock onis special	NSX100/250	☐
	eylock adapter keylock not included	NSX400/630	☐
	eylock onis 1351B.500 ☐	rofalu S5 B24 D4	☐

nterloc in

echanical	oggle ☐	otary handle	☐
By key 2 eylocks, 1 key	eylock adapter keylock not included		☐
or rotary handle	eylock onis 1351B.500 ☐	rofalu S5 B24 D4	☐

nstallation accessories

ront panel escutcheon	oggle	☐
	otary handle, motor mechanism, escutcheon collar I 405	☐
oggle cover		☐
Sealing accessories		☐
DIN rail adapter	NSX100/250	☐

Plug-in / Drawout configuration accessories

u iliary connections	1 automatic connector fixed part with 9 wires (for base)		☐
	1 auto. conn. moving part with 9 wires for circuit breaker		☐
	1 support for 3 automatic connector moving parts		☐
	9-wire manual auxiliary connector (fixed + moving)		☐
lug in base accessories	ong insulated terminals	Set of 3 ☐ Set of 4	☐
	2 I 4 shutters for base		☐
Chassis accessories	scutcheon collar	oggle ☐	☐
	ocking kit keylock not included		☐
	2 carriage switches conn./disconnected position indication		☐
arts of plug in	lug in base C/ C 2 ☐	3 ☐ 4	☐
	Set of 2 power connections	Standard ☐	☐
	Safety trip for advanced opening		☐
	or 3 /4 chassis	oving part	☐
		i ed part	☐

Communication

	NSX Cord 0.35 m ☐	NSX Cord 1.3 m	☐
	NSX Cord 480 C 0.35 m ☐	NSX Cord 3 m	☐
BSC			☐
Communicating motor mechanism 220 240			☐
Switchboard front display module D 121			☐
D mounting accessory			☐
odbus interface			☐
Stacking accessory			☐
line termination			☐
45 connectors female/female ☐	Wire length 45 0.3 m ☐	Wire length 45 0.6 m	☐
	Wire length 45 1 m ☐	Wire length 45 2 m	☐
	Wire length 45 3 m ☐	Wire length 45 5 m	☐

(1) S only

For reference only. www.fengshengelectric.com.sg

Order form: Masterpact NW DC

Name of customer .....

ddress for delivery .....

.....

equested delivery date .....

Customer order no. .....

o indicate your choices, check the applicable square bo es ☐

and enter the appropriate information in the rectangles

Circuit rea er or switch-disconnector t

asterpact type	**N**	☐
	N	☐
	N	☐
Circuit breaker	**N**	☐
Special switch disconnectors	**DCD- N or N**	☐
Switch disconnector		☐
Sensor version	**to**	☐
	to	☐
	to	☐
ersion	**C D E**	☐
ype of equipment	i ed	☐
	Drawout chassis	☐

Communication

C module	odbus	Device	☐	Chassis ☐
ront Display odule D 121			☐	ounting accessory ☐
Breaker Cord		0.35	☐	
		1.3	☐	
		3 m	☐	

Connection

ertical	Standard version	op	☐	Bottom ☐
ori ontal	ertical connection is standard however the connectors can be rotated on site conversion to horizontal connection e cept on the NW40			

ndication contacts

F - N FF indication contacts

Standard	4 O 10 /240 C and low level		
dditional	1 block of 4 O	a . 2 ty	☐

EF - com ined connected closed contacts

	1 6 /240 C	a . 8 ty	☐
	1 low level	a . 8 ty	☐

SDE - fault-trip indication contact

Standard	1 SD 6 /240 C ☐		
dditional	1 SD 6 /240 C ☐	1 SD low level	☐
Carria e switches	ow level ☐	6 /240 C	☐
CE connected position	a . 3 ty		☐
CD disconnected position	a . 3 ty		☐
CT test position	a . 3 ty		☐
C N actuator for CE - CD - CT additional carria e switches	ty		☐

emote operation

Electrical operation	**C** gear motor	☐
	XF closing voltage release	☐
	X opening voltage release	☐
	F ready to close contact ow level	☐
	6 /240 C	☐
	FE electrical closing pushbutton	☐
	ES electrical reset option	☐
	automatic reset option	☐
emote trippin	**N** undervoltage release	☐
	delay unit non ad ustable	☐
	r ad ustable delay unit	☐
	e X shunt release	☐

oc in

- N FF push utton loc in	by transparent cover padlocks ☐

FF position loc in

C	by padlocks			☐
S	by keylocks	eylock kit w/o keylock	rofalu ☐	onis ☐
		1 keylock	rofalu ☐	onis ☐
		2 identical keylocks, 1 key	rofalu ☐	onis ☐
		2 keylocks, different keys	rofalu ☐	onis ☐

Chassis loc in in disconnected position

S D	by keylocks	eylock kit w/o keylock	rofalu ☐	onis ☐
			irt ☐	Castell ☐
		1 keylock	rofalu ☐	onis ☐
		2 identical keylocks, 1 key	rofalu ☐	onis ☐
		2 keylocks, different keys	rofalu ☐	onis ☐
		Optional connected/disconnected/test position locking		☐
EC - door interlock		On right hand side of chassis		☐
		On left hand side of chassis		☐
C - racking interlock				☐
cable type door interlock				☐
DC mismatch protection				☐
C shutter position indication and locking				☐
racking interlock between crank and O pushbutton for NW				☐
D E automatic spring discharge before breaker removal for NW				☐

ccessories

safety shutters on chassis	☐
CD mechanical operation counter	☐
C au iliary terminal shield for chassis	☐
CD escutcheon	☐
C transparent cover for escutcheon	☐
blanking plate for escutcheon	☐

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92506 ueil almaison Cede
 rance

 CS Nanterre 954 503 439
Capital social 896 313 776
www.schneider electric.com

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Sedna

Catalogue 2018



schneider-electric.com

Life Is On Schneider Electric



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Sedna is pure design

Offer to your customers an original alternative to traditional white switches and sockets. With its streamlined design and elegant colors, the Sedna range will give you the edge you are looking for.





Flat design,
8 mm depth

Colors

With 8 colored frames and 6 colored inserts available, you can offer a rich and diverse product range with a minimum of stock management required.

8 colored frames



6 colored inserts



Functions

Sedna offers full functionality of a flexible switch program. Whether switches or sockets, dimmers, thermostats or movement detectors, the Sedna range leaves nothing to be desired and meets all requirements on a modern electrical installation.



1-way switch



1-way switch with pilot lamp



2-circuit switch with pilot lamp



Push-button with pilot lamp



USB charger



Socket outlet with shutters



Socket outlet with shutters



Roller blind control switch



Movement detector



Rotary dimmer



Room thermostat



Rotary push-button dimmer



Tel + data outlet



TV/R/SAT outlet



Movement detector



Socket-outlet with lid, IP44



RJ45



More comfort for your customers…

Combining comfort, lighting and heating control, Sedna has it all. The Advanced functions can help to simplify your customers' lives and demonstrate the added value of your business.

Comfort at the fingertips

The home beats to the rythm of the occupants' personal routine and needs:

- heating systems programmed to offer optimum comfort from the moment residents step through the door;
- light dimmers provide just the right level of brightness;
- roller blinds can be controlled with one flick of a switch.

A safe environment

Sometimes, all it takes is one detail to make the home safer. All Sedna socket outlets come with shutters to prevent accidents. Motion detectors can also provide automatic lighting so that occupants can move around safely and easily during the night.

All the connections they need

Offer your customers a powerful network to connect to the internet or watch television anywhere in the home.





Light control

Advanced light control functions increase comfort and safety: At night, the illuminated switch will guide you in corridors or entrances.

Dimmer

Dim your lights to a pleasant light level.

Movement detector

Automatically switch on and off depending on presence detection and the light condition (light sensor).

Roller blinds control

For protection from sun, cold and unwanted attention or burglary – controlled with one flick of a switch.









Temperature control

With a room thermostat the temperature permanently stays comfortable, but also helps to control energy costs.

Connectivity

Internet, PC, TV, telephones, network technology and multimedia functions for a modern life:

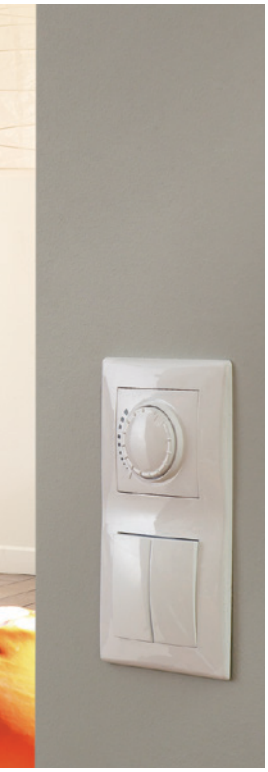
- RJ45
- USB
- TV/R/SAT

IP44

Socket-outlets and switches with IP44 frames are perfect for use in damp rooms like cellars, garages, workshops, production facilities and outdoors.

Socket-outlets

With child protection the terminals of the 220 V socket are inaccessible to children's fingers or with utensils held by playing children.





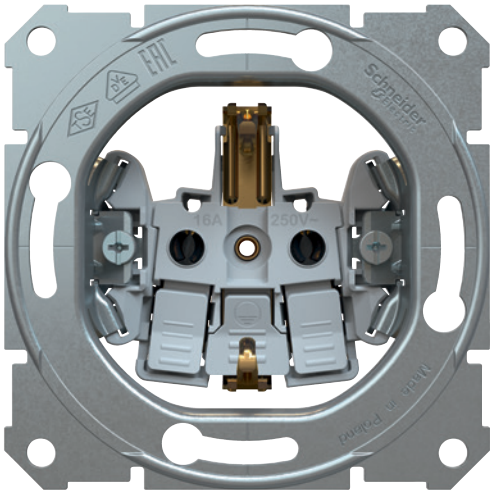


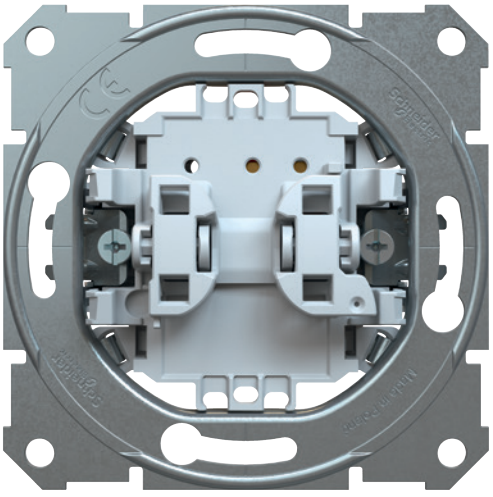
The new generation of inserts that are so easy to install

Do you install switches and socket-outlets on a regular basis? Then we've got good news for you! We've come up with a new generation of socket-outlets and switch inserts that make installation simple, fast and safe.

Designed to meet your needs

At Schneider Electric, we listen to your feedback and we understand what you need to make your day-to-day work run more smoothly. This is why we've recently improved the quality and functionality of inserts for the Sedna range. The updated Sedna range now features reliable screwless socket-outlets, high quality claws, secure robustness as well as additional, smart functions that provide an efficient installation workflow for each step: for connecting, aligning, fastening, fixing and testing! Installation has never been so easy, fast and convenient.



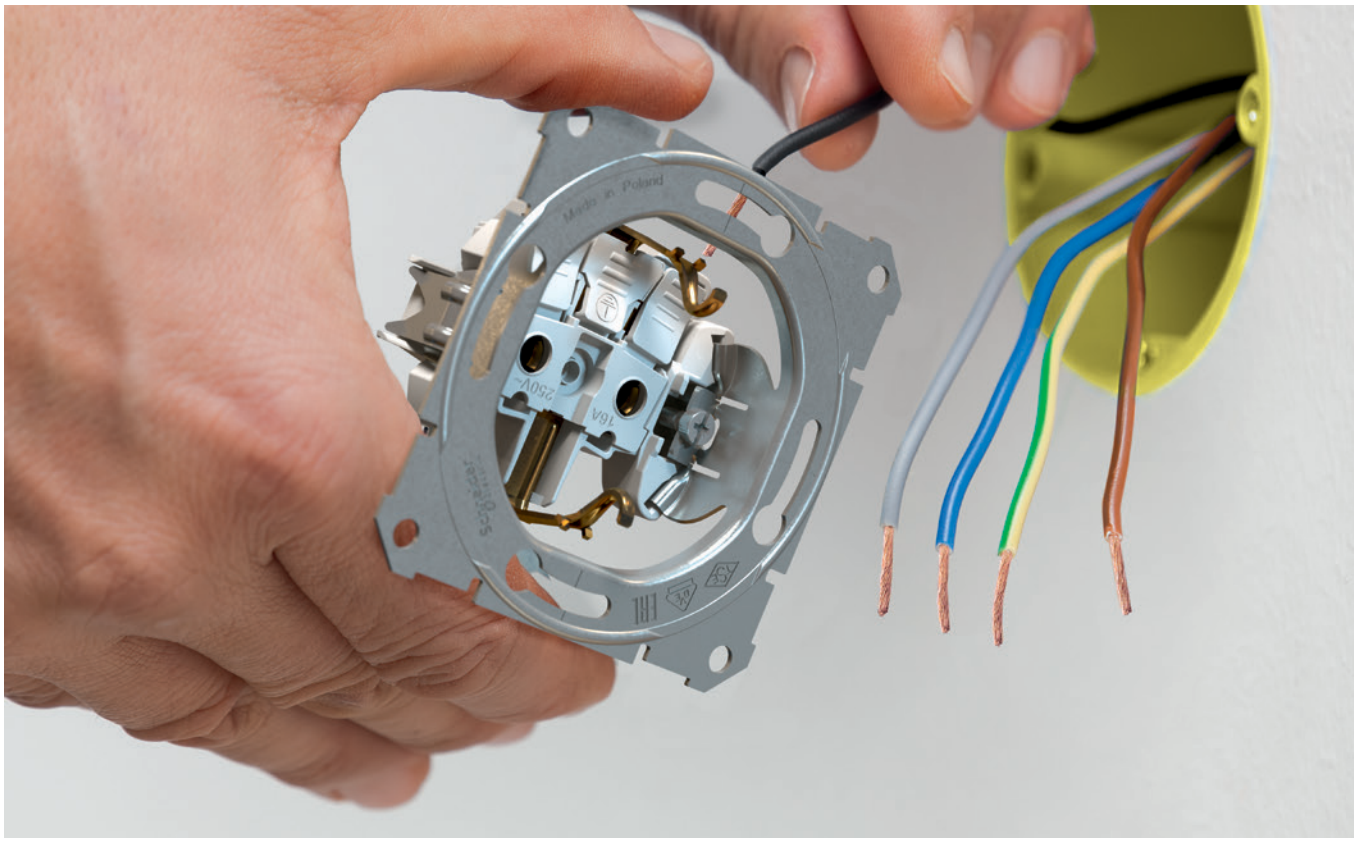


New socket-outlet with screwless terminal

We understand that electricians appreciate the simple, fast and safe installation of flush-mounted inserts. That's why we've come up with screwless socket-outlet terminals - which make wiring easy, quick and reliable. Connected wires stay secure in the terminal.

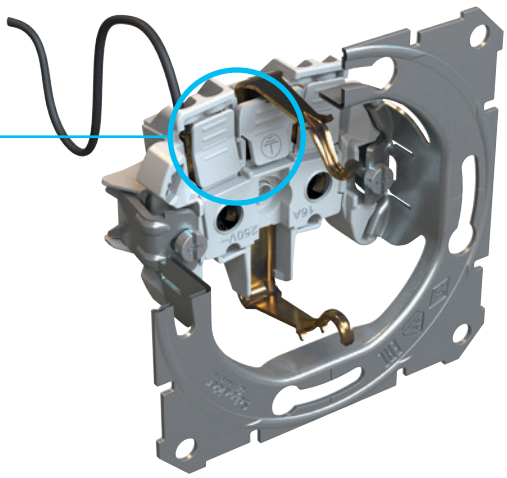
New switch and push-button insert with improved features!

Newly designed switch and push-button inserts let you connect more easily, align more safely, fasten more quickly, test more conveniently, and effortlessly add additional functions.



Socket-outlet with screwless terminal

The new Sedna socket-outlet features a screwless terminal – which has been redesigned, to ensure a simple, fast and safe installation.



NEW!

+ Safe
+ Reliable
+ Screwless

Easy-to-use release buttons

Release buttons are easy to access. Large in size, the release buttons reduce surface pressure on your finger. Improved mechanics now make the release of the fastened wires even smoother.

Switch and push-button inserts

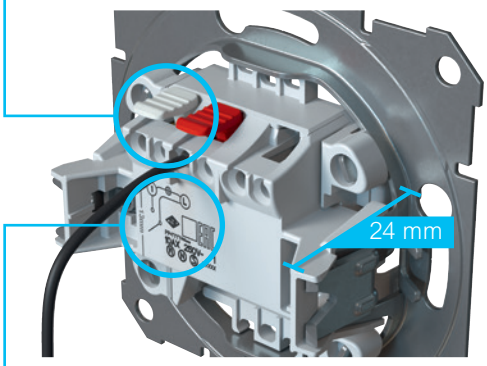
It only takes the slightest glance to notice that numerous features have been optimized to make your installation workflow more efficient.

Release buttons

New button mechanics make the release of fastened wires easier and smoother than ever.

Conical cable entries

Conical cable entries make it easier to feed the connection wires into the terminal blocks. Even thicker wires can be connected in less time thanks to the larger openings.

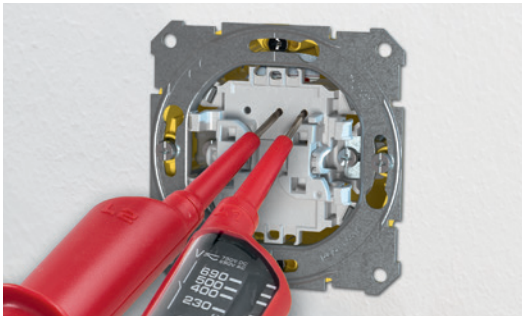


Low mounting depth

A low mounting depth of 24 mm provides more freedom of movement for the insert during the wiring process.

Wiring diagram

The wiring diagram is printed on the rear of the switch and push-button base. Here, the switch type and connection options are clearly visible.



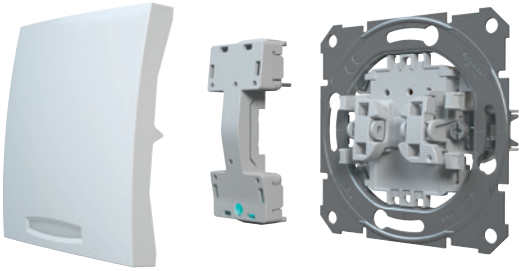
Convenient front-side testing

Checkpoints allow convenient testing of all functions and measuring from the front – and there's no need to disassemble the switch.

Lighting modules

Whether as a first installation or as a renovation, you can now add from a choice of three different LED lighting modules to the new Sedna push-button and switch inserts, without having to remove the inserts.

- LED module indication light, red
- LED module orientation light, blue
- LED light modul for hotel key card switch,blue



Improved!

+ new features
+ easy-to-operate functions
= faster installation!

For a simple, fast and safe installation

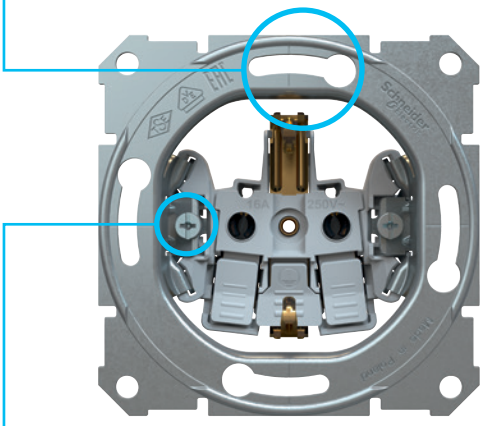
When it comes to aligning and fastening, our innovative new features will make all the difference to your daily installation projects.

Innovative new functions that offer a smooth installation workflow

The new Sedna inserts feature robust fixing frames as well as clear alignment markings, which make switch and socket-outlet insert installation quick and easy – even on uneven walls. Cleverly designed new claws also contribute to an installation procedure that is extremely simple, fast and safe.

Screw slots

The screw slots allow rotation of the insert in either direction, to correct installation boxes that have been misaligned. These slots are a perfect fit for flush mounted box standard screws, so fixing is now even easier and even more secure.

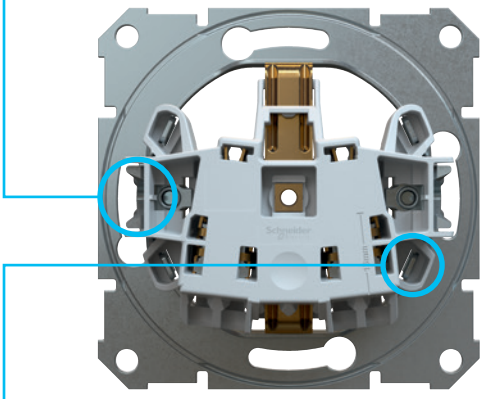


Claw-return function

The claw-return function makes mounting and realignment easier than ever.

Protected claws

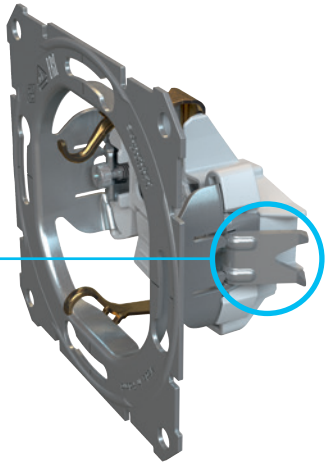
Pre-installation, the claws are fully retracted in the sides of the housing. This means that the claws cannot catch during the installation process, which minimizes the risk of injury. If not required, then the claws remain retracted, which makes for an even easier installation.



4 point fixation

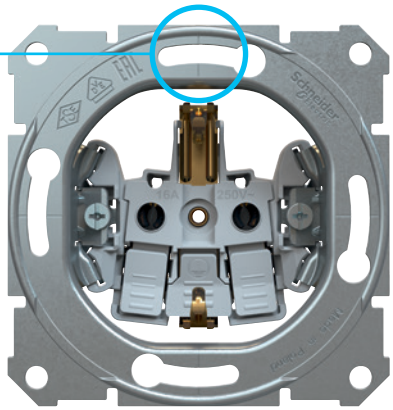
Insert and fixingframe are very robust thanks to the strong and reliable 4 point fixation.





Claws for perfect alignment

Thanks to its redesigned mechanism, the claws extend out straight and smoothly, ensuring a perfect alignment to the wall boxes during assembly. The claws ensure that the insert fixes securely in the box.



Alignment markings

Clear alignment markings make it easy to adjust inserts and give a clear orientation, to ensure perfect alignment of multiple inserts.



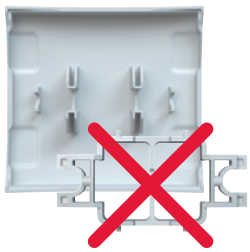
New frames for all conditions

The new Sedna switches and push-buttons provide a new mechanism, that allows easy interlocking of frames, inserts and rockers.

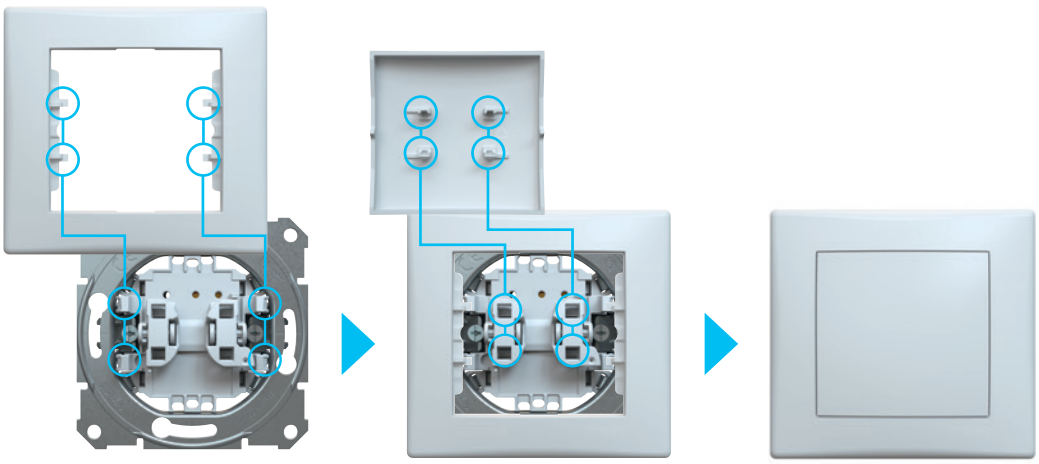
Optimized for your convenience!

With the new “one easy click” mechanism, the frame and the insert can be connected very simply. The optimized interface of both parts allow a simple plug-in and the frame already fits perfectly on the insert. Completely new and practical: No adapter is required to mount the rocker.

No adapter necessary

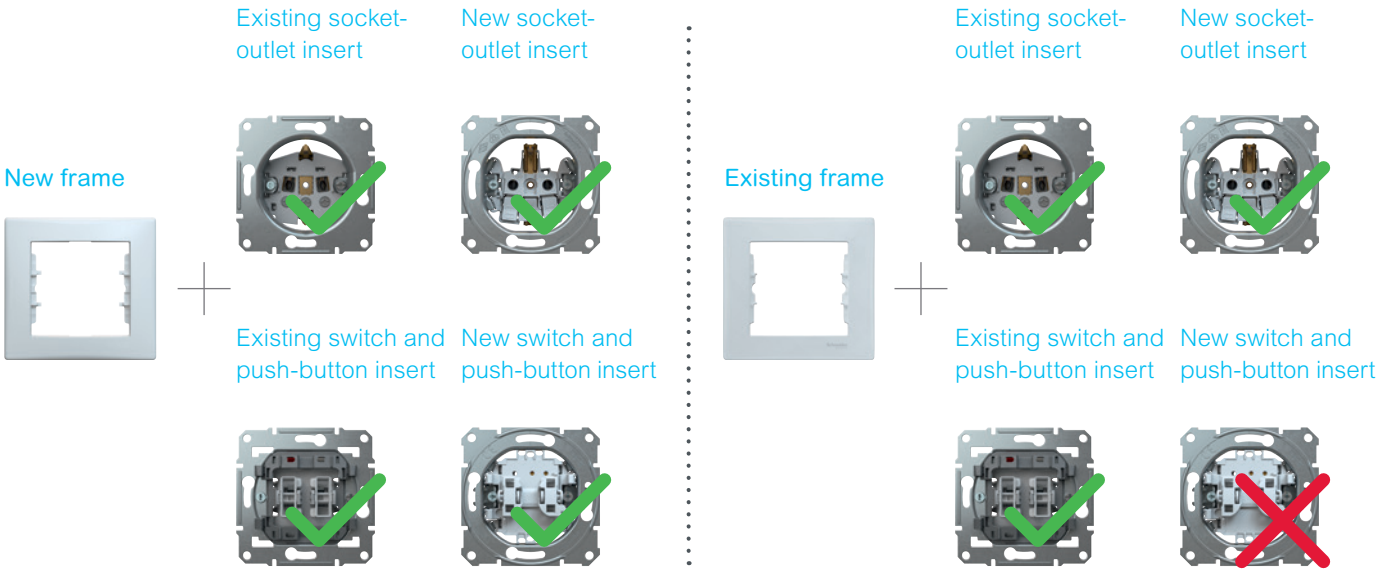


The new “one easy click“ interlocking mechanism



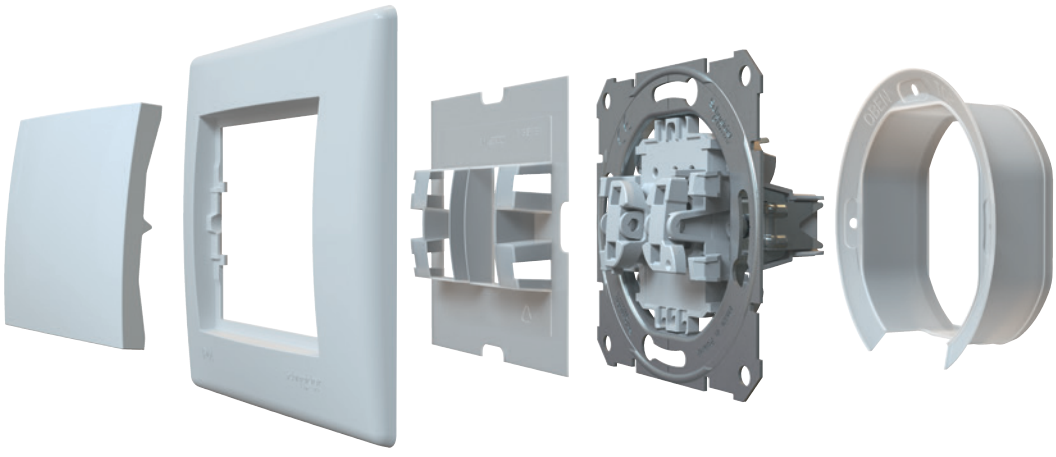
Compatibility means flexibility

Backwards and forwards compatibility gives you the ultimate in installation flexibility, to satisfy your customers' short- and long-term needs.



New IP44 frames

In wet areas or conditions, switches and socket-outlets must conform to strict regulatory standards – which state that they must be weatherproof and must also protect against the threat of moisture. The new Sedna IP44 frames are available in 1-3 gang, horizontal, and come in a complete range of colors. Thanks to the featured membrane seals, these frames meet the IP44 standard for Sedna switches, push-buttons and socket-outlets.




SDN0100121


SDN0400121


SDN0500121

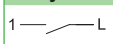
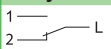
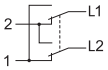
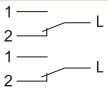
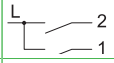
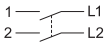

SDN0600121


SDN0300121


SDN0200121

Switches

10 AX - 250 V AC switches

Colour	1-way screwless	2-way screwless
		
white	SDN0100121	SDN0400121
cream	SDN0100123	SDN0400123
aluminium	SDN0100160	SDN0400160
titanium	SDN0100168	SDN0400168
beige	SDN0100147	SDN0400147
graphite	SDN0100170	SDN0400170
	Intermediate screwless	
		
white	SDN0500121	
cream	SDN0500123	
aluminium	SDN0500160	
titanium	SDN0500168	
beige	SDN0500147	
graphite	SDN0500170	
	Double 2-way screwless	
		
white	SDN0600121	
cream	SDN0600123	
aluminium	SDN0600160	
titanium	SDN0600168	
beige	SDN0600147	
graphite	SDN0600170	
	2-circuit screwless	
		
white	SDN0300121	
cream	SDN0300123	
aluminium	SDN0300160	
titanium	SDN0300168	
beige	SDN0300147	
graphite	SDN0300170	
	2-pole screwless	
		
white	SDN0200121	
cream	SDN0200123	
aluminium	SDN0200160	
titanium	SDN0200168	
beige	SDN0200147	
graphite	SDN0200170	


SDN0400421


SDN0200221

16 AX - 250 V AC switches

Colour	2-way screwless 1 — 2 — L
white	SDN0400421
cream	SDN0400423
aluminium	SDN0400460
titanium	SDN0400468
beige	SDN0400447
graphite	SDN0400470
	2-pole screwless 1 — L1 2 — L2
white	SDN0200221
cream	SDN0200223
aluminium	SDN0200260
titanium	SDN0200268
beige	SDN0200247
graphite	SDN0200270


SDN0100321


SDN0400521


SDN0500321


SDN0300421


SDN0200321

IP44 10 AX - 250 V AC switches

Colour	1-way screwless 1 — L	2-way screwless 1 — 2 — L
white	SDN0100321	SDN0400521
cream	SDN0100323	SDN0400523
aluminium	SDN0100360	SDN0400560
titanium	SDN0100368	SDN0400568
beige	SDN0100347	SDN0400547
graphite	SDN0100370	SDN0400570
	Intermediate screwless 2 — L1 L2 1	
white	SDN0500321	
cream	SDN0500323	
aluminium	SDN0500360	
titanium	SDN0500368	
beige	SDN0500347	
graphite	SDN0500370	
	2-circuit screwless L — 2 1	
white	SDN0300421	
cream	SDN0300423	
aluminium	SDN0300460	
titanium	SDN0300468	
beige	SDN0300447	
graphite	SDN0300470	
	2-pole screwless 1 — L1 2 — L2	
white	SDN0200321	
cream	SDN0200323	
aluminium	SDN0200360	
titanium	SDN0200368	
beige	SDN0200347	
graphite	SDN0200370	

Switches (cont'd)

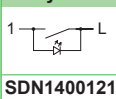
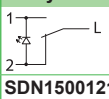
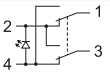
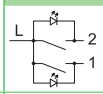
10 AX - 250 V AC switches with blue locator lamp


SDN1400121


SDN1500121


SDN0501121


SDN0300321

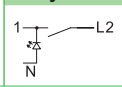
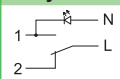
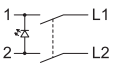
Colour	1-way screwless 	2-way screwless 
white	SDN1400121	SDN1500121
cream	SDN1400123	SDN1500123
aluminium	SDN1400160	SDN1500160
titanium	SDN1400168	SDN1500168
beige	SDN1400147	SDN1500147
graphite	SDN1400170	SDN1500170
	Intermediate screwless 	
white	SDN0501121	
cream	SDN0501123	
aluminium	SDN0501160	
titanium	SDN0501168	
beige	SDN0501147	
graphite	SDN0501170	
	2-circuit screwless 	
white	SDN0300321	
cream	SDN0300323	
aluminium	SDN0300360	
titanium	SDN0300368	
beige	SDN0300347	
graphite	SDN0300370	

10 AX - 250 V AC switches with red indicator lamp


SDN0400321

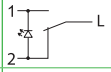

SDN0401121


SDN0201121

Colour	1-way screwless 	2-way screwless 
white	SDN0400321	SDN0401121
cream	SDN0400323	SDN0401123
aluminium	SDN0400360	SDN0401160
titanium	SDN0400368	SDN0401168
beige	SDN0400347	SDN0401147
graphite	SDN0400370	SDN0401170
	2-pole screwless 	
white	SDN0201121	
cream	SDN0201123	
aluminium	SDN0201160	
titanium	SDN0201168	
beige	SDN0201147	
graphite	SDN0201170	

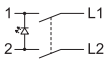

SDN1500221

16 AX - 250 V AC switches with blue locator lamp

Colour	2-way screwless 
white	SDN1500221
cream	SDN1500223
aluminium	SDN1500260
titanium	SDN1500268
beige	SDN1500247
graphite	SDN1500270

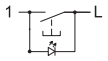

SDN0201221

16 AX - 250 V AC switches with red indicator lamp

Colour	2-pole screwless 
white	SDN0201221
cream	SDN0201223
aluminium	SDN0201260
titanium	SDN0201268
beige	SDN0201247
graphite	SDN0201270


SDN1900121

10 AX - 250 V AC key card switch

Colour	Mechanical, screwless 
white	SDN1900121
cream	SDN1900123
aluminium	SDN1900160
titanium	SDN1900168
beige	SDN1900147
graphite	SDN1900170

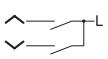
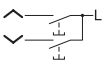
Push-buttons


SDN1300321


SDN1300121

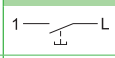
10 AX - 250 V AC switch

10 A - 250 V AC push-button

Colour	With electric lock, screwless 	With electric lock, screwless 
white	SDN1300321	SDN1300121
cream	SDN1300323	SDN1300123
aluminium	SDN1300360	SDN1300160
titanium	SDN1300368	SDN1300168
beige	SDN1300347	SDN1300147
graphite	SDN1300370	SDN1300170


SDN1200121

10 A - 250 V AC cord push-button

Colour	Srewless with cord 
white	SDN1200121
cream	SDN1200123
aluminium	SDN1200160
titanium	SDN1200168
beige	SDN1200147
graphite	SDN1200170


SDN0700121


SDN1100121


SDN0800121


SDN0900121


SDN1000121


SDN0420121

Push-buttons

10 A - 250 V AC push-buttons

Colour	1-way, screwless	Double-1-way, screwless
white	SDN0700121	SDN1100121
cream	SDN0700123	SDN1100123
aluminium	SDN0700160	SDN1100160
titanium	SDN0700168	SDN1100168
beige	SDN0700147	
graphite	SDN0700170	SDN1100170
	1-way, with bell symbol, screwless	**1-way, with light symbol, screwless**
white	SDN0800121	SDN0900121
cream	SDN0800123	SDN0900123
aluminium	SDN0800160	SDN0900160
titanium	SDN0800168	SDN0900168
beige	SDN0800147	SDN0900147
graphite	SDN0800170	SDN0900170
	1-way, with trash bin symbol, screwless	
white	SDN1000121	
cream	SDN1000123	
aluminium	SDN1000160	
titanium	SDN1000168	
beige	SDN1000147	
graphite	SDN1000170	
	2-way screwless	
white	SDN0420121	
cream	SDN0420123	
aluminium	SDN0420160	
titanium	SDN0420168	
beige	SDN0420147	
graphite	SDN0420170	


SDN0800321


SDN0900321

IP44 10 A - 250 V AC push-buttons

Colour	1-way, with bell symbol, screwless	1-way, with light symbol, screwless
white	SDN0800321	SDN0900321
cream	SDN0800323	SDN0900323
aluminium	SDN0800360	SDN0900360
titanium	SDN0800368	SDN0900368
beige	SDN0800347	SDN0900347
graphite	SDN0800370	SDN0900370


SDN1600121


SDN1520121


SDN1600421


SDN1800121



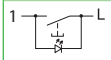
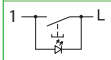
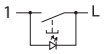
SDN1600321

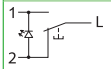
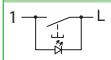

SDN1700121



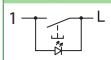
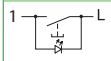
SDN1700421

10 A - 250 V AC push-buttons with blue locator lamp

Colour	1-way, screwless	1-way, with bell symbol, screwless	1-way, with light symbol, screwless
			
white	SDN1600121	SDN1600421	SDN1800121
cream	SDN1600123	SDN1600423	SDN1800123
aluminium	SDN1600160	SDN1600460	SDN1800160
titanium	SDN1600168	SDN1600468	SDN1800168
beige	SDN1600147	SDN1600447	SDN1800147
graphite	SDN1600170	SDN1600470	SDN1800170

Colour	2-way, screwless	1-way, with label holder, screwless
		
white	SDN1520121	SDN1600321
cream	SDN1520123	SDN1600323
aluminium	SDN1520160	SDN1600360
titanium	SDN1520168	SDN1600368
beige		SDN1600347
graphite	SDN1520170	SDN1600370

10 A - 12 V AC push-buttons with blue locator lamp

Colour	1-way, with bell symbol, screwless	1-way, with label holder, screwless
		
white	SDN1700121	SDN1700421
cream	SDN1700123	SDN1700423
aluminium	SDN1700160	SDN1700460
titanium	SDN1700168	SDN1700468
beige	SDN1700147	
graphite	SDN1700170	SDN1700470

Comfort controls

Rotary dimmers


SDN2200621


SDN2200421

Colour	RC, 230 V, 25-325 VA	RL, 230 V, 60-500 VA
white	SDN2200621	SDN2200421
cream	SDN2200623	SDN2200423
aluminium	SDN2200660	SDN2200460
titanium	SDN2200668	SDN2200468
beige	SDN2200647	SDN2200447
graphite	SDN2200670	SDN2200470

Rotary push-button dimmers


SDN2200721


SDN2200521

Colour	RC, 230 V, 25-325 VA, two-way	RL, 230 V, 60-500 VA, two-way
white	SDN2200721	SDN2200521
cream	SDN2200723	SDN2200523
aluminium	SDN2200760	SDN2200560
titanium	SDN2200768	SDN2200568
beige	SDN2200747	SDN2200547
graphite	SDN2200770	SDN2200570


SDN2200921

	RL, 230 V, 1000 VA
white	SDN2200921
cream	SDN2200923
aluminium	SDN2200960
titanium	SDN2200968
beige	SDN2200947
graphite	SDN2200970

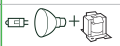
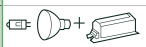
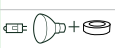
- with an additional switch output which enables an additional load to be switched on and off
- minimum brightness setting.

Rotary push-button universal LED dimmer


SDN2201221

Colour	RL-RC, 230 V, 4-400 VA, two-way
white	SDN2201221
cream	SDN2201223
aluminium	SDN2201260
titanium	SDN2201268
beige	SDN2201247
graphite	SDN2201270

Load table

 SDN22006XX	 SDN22004XX	 SDN22009XX	 SDN22007XX	 SDN22005XX	 SDN22012XX		
						Maximum loads	
25-325 W	60-500 W	40-1000 W	25-325 W	60-500 W	4-400 W		incandescent lamps
25-325 W	60-500 W	40-1000 W	25-325 W	60-500 W	4-400 W		230 V AC halogen lamps
	60-500 VA	60-1000 VA		60-500 VA	4-400 VA		230 V/12 V AC halogen lamps with ferromagnetic tranformer
25-325 VA			25-325 VA		4-400 VA		230 V/12 V AC halogen lamps with electronic tranformer
					4-400 VA		230 V/12 V AC halogen lamps with toroidal tranformer
		60-600 W					230 V AC single-phase motors
					4-200 VA		LED lamps (RC-mode)
					4-40 VA		LED lamps (RL-LED-mode)
						Fuse	
						2.5 A(H)	
						Electronic	

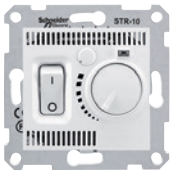
Mechanisms
without cover frame



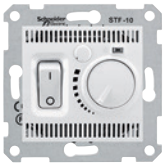
SDN2000221

Movement detectors

Colour	10 A - 230 V AC, detector with time delay and ambiant light adjustment
white	**SDN2000221**
cream	**SDN2000223**
aluminium	**SDN2000260**
titanium	**SDN2000268**
beige	**SDN2000247**
graphite	**SDN2000270**
	max 20 min - 5 Lux - ∞ - operating angle: 180°



SDN6000121



SDN6000321

Thermostats

Colour	10 A - 230 V AC, room thermostat	10 A - 230 V AC, floor thermostat
white	**SDN6000121**	**SDN6000321**
cream	**SDN6000123**	**SDN6000323**
aluminium	**SDN6000160**	**SDN6000360**
titanium	**SDN6000168**	**SDN6000368**
beige	**SDN6000147**	**SDN6000347**
graphite	**SDN6000170**	**SDN6000370**
		• Delivered with 4.0 m sensor • External sensor: NTC 10 kΩ at 25 °C



SDN6001121

Colour	10 A - 230 V AC, room thermostat with cooling mode
white	**SDN6001121**
cream	**SDN6001123**
aluminium	**SDN6001160**
titanium	**SDN6001168**
beige	**SDN6001147**
graphite	**SDN6001170**
	Complete assembled products. Can not be used in multigang frame installation



SDN2710221

USB chargers

Colour	Double USB chargers, 2.1 A
white	**SDN2710221**
cream	**SDN2710223**
aluminium	**SDN2710260**
titanium	**SDN2710268**
beige	**SDN2710247**
graphite	**SDN2710270**
	• Nominal input voltage: 100-240 V AC ±10 % • USB output voltage: 5 V DC ± 5 % • Nominal output current: 1 x 2.1 A or 2 x 1.05 A (for 2 outputs) • Power consumption: < 0.1 W (in stand-by) • Maximum output power: 10.5 W • Expected lifetime: 30 000 h for ouput power 10.5 W • Overvoltage category: OVC III • Isolation class: class II


SDN3000121


SDN3100121

Socket-outlets

Side earth socket-outlets

Colour	16 A - 250 V AC, 2P+E, shuttered, lift terminals	16 A - 250 V AC, 2P+E, shuttered, screwless	16 A - 250 V AC, 2P+E, shuttered, lift terminals, with lid	16 A - 250 V AC, 2P+E, shuttered, screwless, with lid
white	SDN3000121	SDN3001721	SDN3100121	SDN3100421
cream	SDN3000123	SDN3001723	SDN3100123	SDN3100423
aluminium	SDN3000160	SDN3001760	SDN3100160	SDN3100460
titanium	SDN3000168	SDN3001768	SDN3100168	SDN3100468
beige	SDN3000147	SDN3001747	SDN3100147	SDN3100447
graphite	SDN3000170	SDN3001770	SDN3100170	SDN3100470
red	SDN3000341			


SDN3000521


SDN2800321

	16 A - 250 V AC, 2P+E, lift terminals	16 A - 250 V AC, 2P+E, screwless	16 A - 250 V AC, 2P+E, shuttered, lift terminals, with lid	16 A - 250 V AC, 2P+E, IP44, shuttered, screwless, with lid
white	SDN3000521	SDN3001821	SDN3100321	SDN3100521
cream	SDN3000523	SDN3001823	SDN3100323	SDN3100523
aluminium	SDN3000560	SDN3001860	SDN3100360	SDN3100560
titanium	SDN3000568	SDN3001868	SDN3100368	SDN3100568
beige	SDN3000547	SDN3001847	SDN3100347	SDN3100547
graphite	SDN3000570	SDN3001870	SDN3100370	SDN3100570

Pin earth socket-outlets


SDN2800121


SDN2800321

Colour	16 A - 250 V AC, 2P+E, shuttered, lift terminals	16 A - 250 V AC, 2P+E, shuttered screwless	16 A - 250 V AC, 2P+E, IP44, shuttered, lift terminals, with lid	16 A - 250 V AC, 2P+E, IP44 shuttered, screwless, with lid
white	SDN2800121	SDN2800721	SDN2800321	SDN2800821
cream	SDN2800123	SDN2800723	SDN2800323	SDN2800823
aluminium	SDN2800160	SDN2800760	SDN2800360	SDN2800860
titanium	SDN2800168	SDN2800768	SDN2800368	SDN2800868
beige	SDN2800147	SDN2800747	SDN2800347	SDN2800847
graphite	SDN2800170	SDN2800770	SDN2800370	SDN2800870
red	SDN2800441			

Socket-outlets without earth


SDN2900121

Colour	16 A - 250 V AC, 2P, lift terminals	16 A - 250 V AC, 2P, screwless
white	SDN2900121	SDN2900221
cream	SDN2900123	SDN2900223
aluminium	SDN2900160	SDN2900260
titanium	SDN2900168	SDN2900268
beige	SDN2900147	SDN2900247
graphite	SDN2900170	SDN2900270

Double socket-outlet with pin earth - PL standard - multigang


SDN2800921

Colour	16 A - 250 V AC, 2P+E, lift terminals
white	SDN2800921
cream	SDN2800923
aluminium	SDN2800960
titanium	SDN2800968
graphite	SDN2800970


SDN4300121


SDN4500121


SDN4400121


SDN4600121

Data outlets

RJ45 category 5e

Colour	1 x RJ45, cat. 5e, UTP, IDC*	1 x RJ45, cat. 5e, STP, IDC*
white	SDN4300121	SDN4500121
cream	SDN4300123	SDN4500123
aluminium	SDN4300160	SDN4500160
titanium	SDN4300168	SDN4500168
beige	SDN4300147	SDN4500147
graphite	SDN4300170	SDN4500170
	2 x RJ45, cat. 5e, UTP, IDC*	**2 x RJ45, cat. 5e, STP, IDC***
white	SDN4400121	SDN4600121
cream	SDN4400123	SDN4600123
aluminium	SDN4400160	SDN4600160
titanium	SDN4400168	SDN4600168
beige	SDN4400147	SDN4600147
graphite	SDN4400170	SDN4600170


SDN4700121


SDN4900121

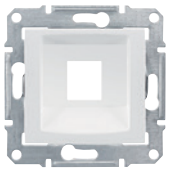

SDN4800121

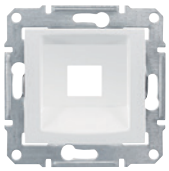

SDN5000121

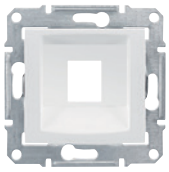
RJ45 category 6

Colour	1 x RJ45, cat. 6, UTP, IDC*	1 x RJ45, cat. 6, STP, IDC*
white	SDN4700121	SDN4900121
cream	SDN4700123	SDN4900123
aluminium	SDN4700160	SDN4900160
titanium	SDN4700168	
beige	SDN4700147	SDN4900147
graphite	SDN4700170	SDN4900170
	2 x RJ45, cat. 6, UTP, IDC*	**2 x RJ45, cat. 6, STP, IDC***
white	SDN4800121	SDN5000121
cream	SDN4800123	SDN5000123
aluminium	SDN4800160	SDN5000160
titanium	SDN4800168	
beige	SDN4800147	SDN5000147
graphite	SDN4800170	SDN5000170

* IDC: Insulation Displacement Connection in RJ45 connectors.


SDN4300321


SDN4300421


SDN4300521

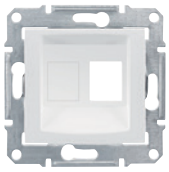

SDN4300621

Plate for 1 x RJ45 without connectors

Colour	KRONE, cat. 5e, cat. 6, UTP	RDM, cat. 5e, cat. 6, UTP
white	SDN4300321	SDN4300421
cream	SDN4300323	SDN4300423
aluminium	SDN4300360	SDN4300460
titanium		SDN4300468
beige		
graphite	SDN4300370	SDN4300470
	SYSTIMAX, cat. 5e, cat. 6, UTP	**AMP, MOLEX, KELINE, cat. 5e, cat. 6, UTP**
white	SDN4300521	SDN4300621
cream		SDN4300623
aluminium	SDN4300560	SDN4300660
titanium		SDN4300668
beige		SDN4300647
graphite	SDN4300570	SDN4300670

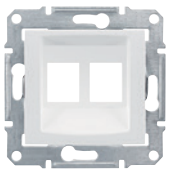

SDN4400621

Plate for 2 x RJ45 without connectors

Colour	AMP, MOLEX, KELINE, cat. 5e, cat. 6, UTP
white	SDN4400621
cream	SDN4400623
aluminium	SDN4400660
titanium	SDN4400668
beige	SDN4400647
graphite	SDN4400670


SDN4101121


SDN4201121

Telephone outlets

RJ11

Colour	1 x RJ11, screw terminals	2 x RJ11, screw terminals
white	SDN4101121	SDN4201121
cream	SDN4101123	SDN4201123
aluminium	SDN4101160	SDN4201160
titanium	SDN4101168	SDN4201168
beige	SDN4101147	SDN4201147
graphite	SDN4101170	SDN4201170


SDN5100121


SDN5200121

Telephone + data outlets

Colour	RJ11 + RJ45, cat. 5e, UTP, IDC* + screw terminals	
white	SDN5100121	
cream	SDN5100123	
aluminium	SDN5100160	
titanium	SDN5100168	
beige	SDN5100147	
graphite	SDN5100170	
	RJ11 + RJ45, cat. 6, UTP, IDC* + screw terminals	**RJ11 + RJ45, cat. 6, STP, IDC* + screw terminals**
white	SDN5200121	
cream	SDN5200123	SDN5200223
aluminium	SDN5200160	SDN5200260
titanium	SDN5200168	SDN5200268
beige	SDN5200147	SDN5200247
graphite	SDN5200170	

* IDC: Insulation Displacement Connection in RJ45 connectors.

TV/R/SAT outlets

TV


SDN3201221


SDN3201821


SDN3201621

Colour	TV connector, intermediate, 4 dB	TV connector, intermediate, 8 dB
white	SDN3201821	SDN3201221
cream	SDN3201823	SDN3201223
aluminium	SDN3201860	SDN3201260
titanium	SDN3201868	SDN3201268
beige	SDN3201847	SDN3201247
graphite	SDN3201870	SDN3201270
	TV connector ending, 1 dB	
white	SDN3201621	
cream	SDN3201623	
aluminium	SDN3201660	
titanium	SDN3201668	
beige	SDN3201647	
graphite	SDN3201670	

TV/R



SDN3301821



SDN3301321



SDN3301621

Colour	TV/R outlet, intermediate, 4 dB	TV/R outlet, intermediate, 8 dB
white	SDN3301821	SDN3301321
cream	SDN3301823	SDN3301323
aluminium	SDN3301860	SDN3301360
titanium	SDN3301868	SDN3301368
beige	SDN3301847	SDN3301347
graphite	SDN3301870	SDN3301370
	TV/R outlet, ending, 1 dB	
white	SDN3301621	
cream	SDN3301623	
aluminium	SDN3301660	
titanium	SDN3301668	
beige	SDN3301647	
graphite	SDN3301670	

TV/SAT



SDN3401921



SDN3401221



SDN3401621

Colour	TV/SAT outlet, intermediate, 4 dB	TV/SAT outlet, intermediate, 8 dB
white	SDN3401921	SDN3401221
cream	SDN3401923	SDN3401223
aluminium	SDN3401960	SDN3401260
titanium	SDN3401968	SDN3401268
beige	SDN3401947	SDN3401247
graphite	SDN3401970	SDN3401270
	TV/SAT outlet, ending, 1 dB	
white	SDN3401621	
cream	SDN3401623	
aluminium	SDN3401660	
titanium	SDN3401668	
beige	SDN3401647	
graphite	SDN3401670	



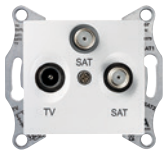
SDN3501421



SDN3501221



SDN3501321



SDN3502121



SDN3511121



SDN3311321



SDN3411221


SDN5400121

TV/R/SAT outlets (cont'd)

TV/R/SAT

Colour	TV/R/SAT outlet, intermediate, 4 dB	TV/R/SAT outlet, intermediate, 8 dB
white	SDN3501421	SDN3501221
cream	SDN3501423	SDN3501223
aluminium	SDN3501460	SDN3501260
titanium	SDN3501468	SDN3501268
beige	SDN3501447	SDN3501247
graphite	SDN3501470	SDN3501270
	TV/R/SAT outlet, ending, 1 dB	
white	SDN3501321	
cream	SDN3501323	
aluminium	SDN3501360	
titanium	SDN3501368	
beige	SDN3501347	
graphite	SDN3501370	

TV/SAT/SAT

Colour	TV/SAT/SAT outlet, ending, 1 dB	TV/R/SAT center plates
white	SDN3502121	SDN3511121
cream	SDN3502123	
aluminium	SDN3502160	SDN3511160
titanium	SDN3502168	
beige	SDN3502147	
graphite	SDN3502170	SDN3511170
	TV/R center plates	**TV/SAT center plates**
white	SDN3311321	SDN3411221
cream		
aluminium	SDN3311360	SDN3411260
titanium		
beige		
graphite	SDN3311370	SDN3411270

Loudspeaker outlet

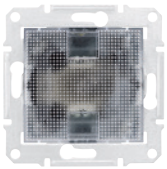
Colour	Double loudspeaker outlet, screwless
white	SDN5400121
cream	SDN5400123
aluminium	SDN5400160
titanium	SDN5400168
beige	SDN5400147
graphite	SDN5400170



SDN5500121



SDN5600121



SDN5900123

Complementary offers

Colour	Cable outlet 250 V - 25 A
white	SDN5500121
cream	SDN5500123
aluminium	SDN5500160
titanium	SDN5500168
beige	SDN5500147
graphite	SDN5500170
	Blind cover
white	SDN5600121
cream	SDN5600123
aluminium	SDN5600160
titanium	SDN5600168
beige	SDN5600147
graphite	SDN5600170
	Night light lamp 250 V - 3 W
	SDN5900123


SDN0400821


SDN3000821

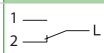

SDN3000421


SDN2800521


SDN2800621

Switches

1 pole 2 way switch

Colour	10 AX with frame white
	
white	SDN0400821

Socket-outlets

Single socket-outlet, side earth

Colour	16 A shutters, with frame white
white	SDN3000821

Double socket-outlet with side earth

Colour	16 A - 250 V AC, 2P+E, shuttered with lift terminals
white	SDN3000421
cream	SDN3000423
aluminium	SDN3000460
titanium	SDN3000468
beige	SDN3000447
graphite	SDN3000470

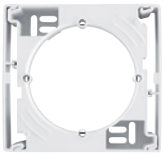
Double socket-outlet with pin earth - CZ, SK standard

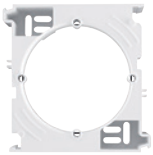
Colour	16 A - 250 V AC, 2P+E, shuttered with lift terminals
white	SDN2800521
cream	SDN2800523
aluminium	SDN2800560
titanium	SDN2800568
beige	SDN2800547
graphite	SDN2800570

Double socket-outlet with pin earth - PL standard

Colour	16 A - 250 V AC, 2P+E, shuttered with lift terminals
white	SDN2800621
cream	SDN2800623
aluminium	SDN2800660
titanium	SDN2800668
graphite	SDN2800670

Horizontal surface mounting boxes


SDN6100121


SDN6100221

Colour	1 gang	Multi-gang, universal
white	**SDN6100121**	**SDN6100221**
cream	**SDN6100123**	**SDN6100223**
aluminium	**SDN6100160**	**SDN6100260**
titanium	**SDN6100168**	**SDN6100268**
beige	**SDN6100147**	**SDN6100247**
graphite	**SDN6100170**	**SDN6100270**
		2-gang box: SDN61001xx + SDN61002xx 3-gang box: SDN61001xx + 2 x SDN61002xx


SDN5800121


SDN5810521


SDN5800321


SDN5810621


SDN5801121


SDN5800521


SDN5810721


SDN5801321


SDN5800721


SDN5802021

Colour	1 gang	1 gang- IP 44
white	SDN5800121	SDN5810521
cream	SDN5800123	SDN5810523
aluminium	SDN5800160	SDN5810560
titanium	SDN5800168	SDN5810568
beige	SDN5800147	SDN5810547
graphite	SDN5800170	SDN5810570
grey	SDN5800133	
red	SDN5800141	
	2 gang horizontal frame	**2 gang horizontal- IP44**
white	SDN5800321	SDN5810621
cream	SDN5800323	SDN5810623
aluminium	SDN5800360	SDN5810660
titanium	SDN5800368	SDN5810668
beige	SDN5800347	SDN5810647
graphite	SDN5800370	SDN5810670
grey	SDN5800333	
red	SDN5800341	
	2 gang vertical frame	
white	SDN5801121	
cream	SDN5801123	
aluminium	SDN5801160	
titanium	SDN5801168	
beige	SDN5801147	
graphite	SDN5801170	
grey	SDN5801133	
red	SDN5801141	
	3 gang horizontal frame	**3 gang horizontal- IP44**
white	SDN5800521	SDN5810721
cream	SDN5800523	SDN5810723
aluminium	SDN5800560	SDN5810760
titanium	SDN5800568	SDN5810768
beige	SDN5800547	SDN5810747
graphite	SDN5800570	SDN5810770
grey	SDN5800533	
red	SDN5800541	
	3 gang vertical frame	
white	SDN5801321	
cream	SDN5801323	
aluminium	SDN5801360	
titanium	SDN5801368	
beige	SDN5801347	
graphite	SDN5801370	
grey	SDN5801333	
red	SDN5801341	
	4 gang horizontal frame	
white	SDN5800721	
cream	SDN5800723	
aluminium	SDN5800760	
titanium	SDN5800768	
beige	SDN5800747	
graphite	SDN5800770	
grey	SDN5800733	
red	SDN5800741	
	4 gang vertical frame	
white	SDN5802021	
cream	SDN5802023	
aluminium	SDN5802060	
titanium	SDN5802068	
beige	SDN5802047	
graphite	SDN5802070	
grey	SDN5802033	
red	SDN5802041	



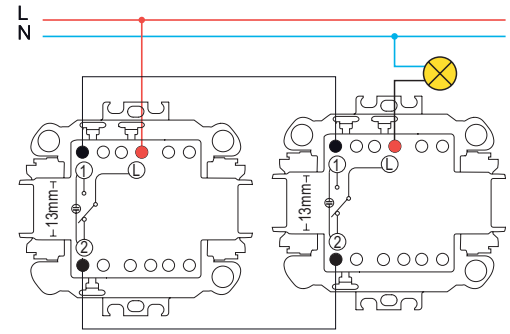
SDN5800921



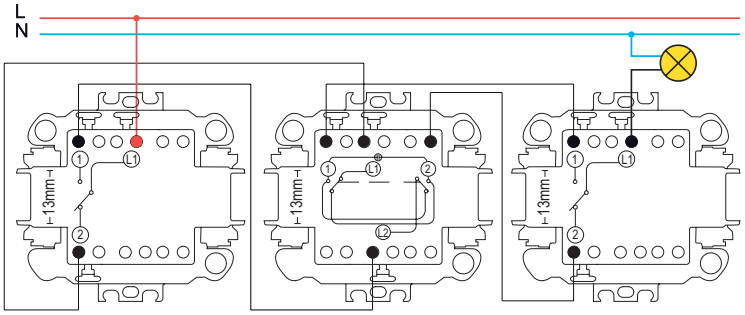
SDN5801521

Colour	5 gang horizontal frame
white	**SDN5800921**
cream	**SDN5800923**
aluminium	**SDN5800960**
titanium	**SDN5800968**
beige	**SDN5800947**
graphite	**SDN5800970**
grey	**SDN5800933**
red	**SDN5800941**
	5 gang vertical frame
white	**SDN5801521**
cream	**SDN5801523**
aluminium	**SDN5801560**
titanium	**SDN5801568**
beige	**SDN5801547**
graphite	**SDN5801570**
grey	**SDN5801533**
red	**SDN5801541**

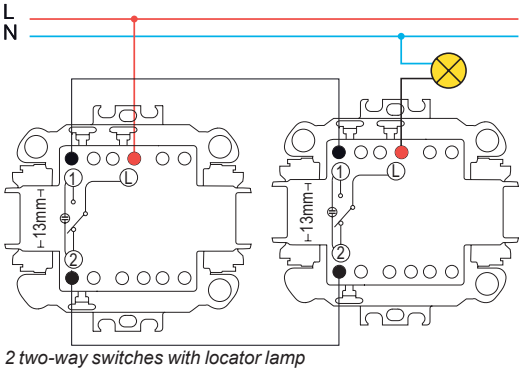
Switches and push-buttons connection examples



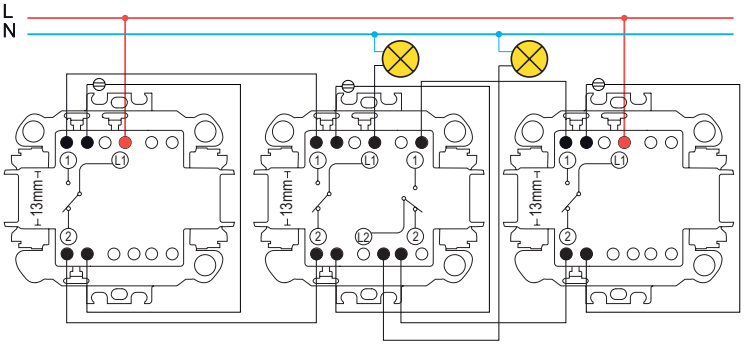
2 two-way switches



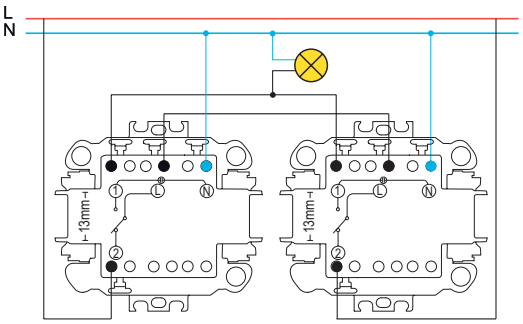
2 two-way switches + 1 intermediate switch



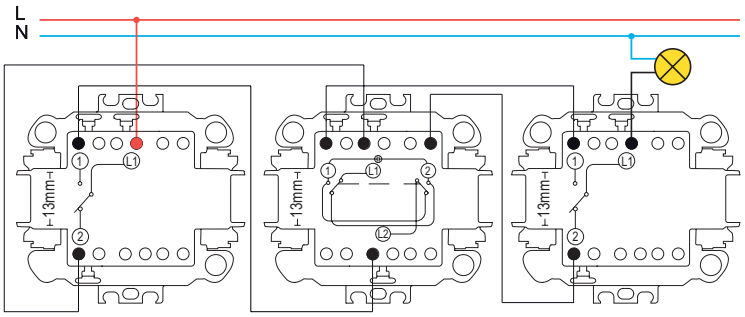
2 two-way switches with locator lamp



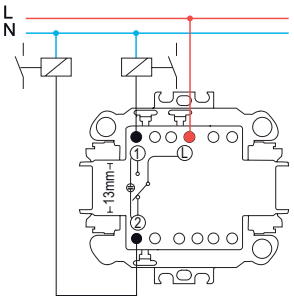
2 two-way switches + 1 double two-way switches



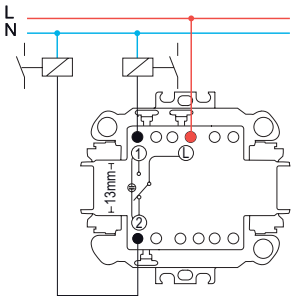
2 two-way switches with indicator lamp



2 two-way switches + 1 intermediate switch with locator lamp

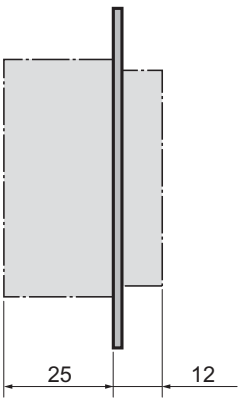


Two-way push-button



Two-way push-button with locator lamp

Dimensions (mm)



Rotary dimmers RC, 25-325 VA - SDN22006XX

Area of application

- Regulation of different loads (see load table) for homes and buildings.
- Suitable for renovation as it allows replacement of a switch by a regulator without having to change cables.
- As the regulator reduces the current supplying the load, it allows considerable energy savings.

Technical data

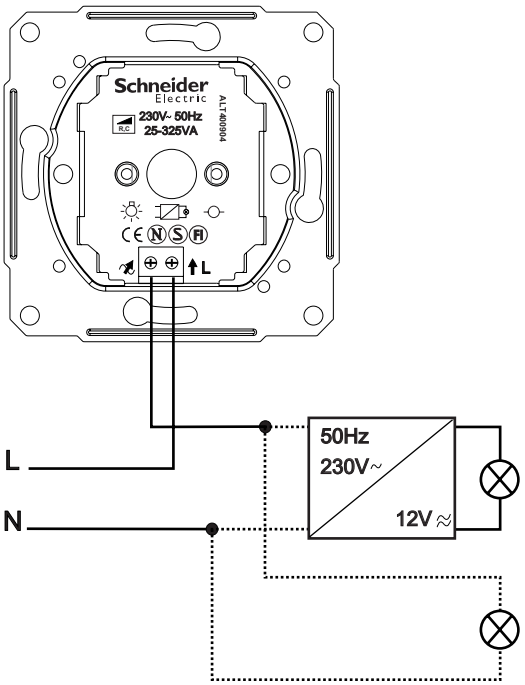
- Rated voltage: 230 V AC ± 10 %, 50 Hz,
- Connectable as switch,
- IP degree of protection: IP20,
- Conformity mark: CE,
- Standard: EN 60669-2-1.

Load table

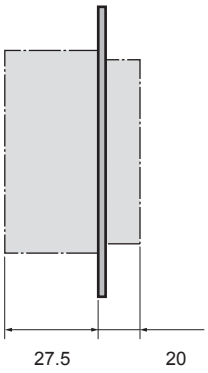
25°C 230 V 50 Hz	1	2	3	4
Max.	325 W	325 W	NO	325 VA
Min.	25 W	25 W		25 VA

1 - Incandescent lamps
2 - Halogen lamps
3 - Low voltage halogen lamps with ferromagnetic transformer
4 - Low voltage halogen lamps with electronic transformers

Connections



Dimensions (mm)



Rotary dimmers RL, 60-500 VA - SDN22004XX

Area of application

- Regulation of different loads (see load table) for homes and buildings.
- Suitable for renovation as it allows replacement of a switch by a regulator without having to change cables.
- As the regulator reduces the current supplying the load, it allows considerable energy savings.

Technical data

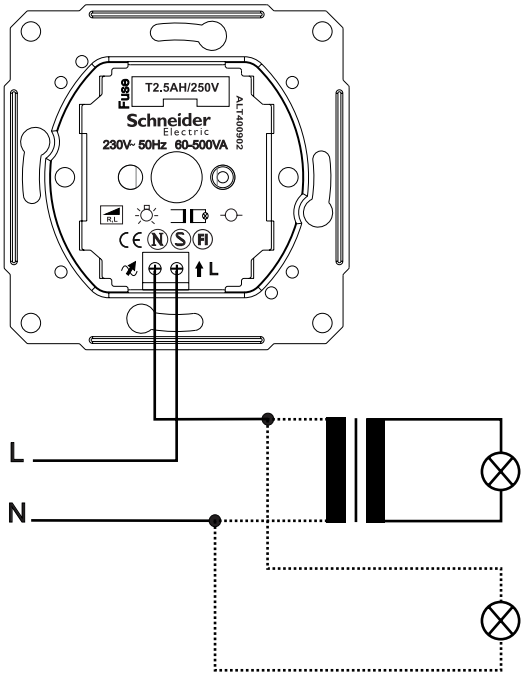
- Rated voltage: 230 V AC ± 10 %, 50 Hz,
- Connectable as switch,
- IP degree of protection: IP20,
- Conformity mark: CE,
- Standard: EN 60669-2-1.

Load table

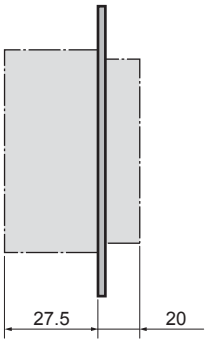
25°C 230 V 50 Hz	1	2	3	4
Max.	500 W	500 W	500 VA	NO
Min.	60 W	60 W	60 VA	

1 - Incandescent lamps
2 - Halogen lamps
3 - Low voltage halogen lamps with ferromagnetic transformer
4 - Low voltage halogen lamps with electronic transformers

Connections



Dimensions (mm)



Rotary push-button dimmers RL, 230 V, 1000 VA - SDN22009XX

Area of application

- Regulation of different loads (see load table) for homes and buildings.
- As the regulator reduces the current supplying the load, it allows considerable energy savings.
- A comfort feature: setting minimum brightness level.
- Additional ON/OFF supply possibility to additional load with separated terminal output.

Technical data

- Rated voltage: 230 V AC ± 10 %, 50 Hz
- Load on the switch output: max. 2 A, cos ø 0.6,
- IP degree of protection: IP20,
- Conformity mark: CE,
- Standard: EN 60669-2-1.

Load table

25°C 230 V 50 Hz	1	2	3	4	5
Max.	1000 W	1000 W	1000 VA	NO	600 VA
Min.	40 W	40 W	60 VA		60 VA

1 - Incandescent lamps
2 - Halogen lamps
3 - Low voltage halogen lamps with ferromagnetic transformer
4 - Low voltage halogen lamps with electronic transformers
5 - Single-phase motors

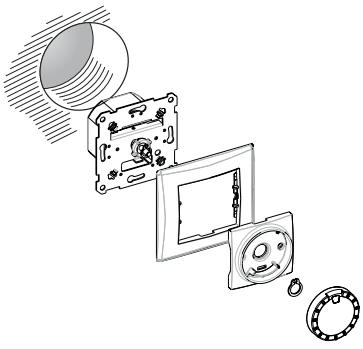
Installation

The maximum allowed load is reduced due to the decreased heat dissipation when you do not install the device into a single standard flushmounting box:

Load reduction by	Mounted in cavity walls*	Several installed together in combination*	In 1-gang or 2-gang surface-mounted housing	In 3-gang surface-mounted housing
25 %	■	■		
30 %			■	
50 %				■

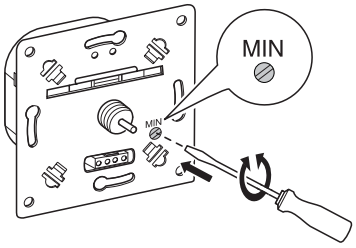
* If several factors apply, add the load reductions together.

Installing the dimmer and covers



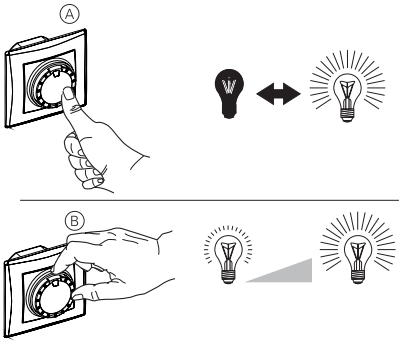
Use

Setting the minimum brightness of the lamps



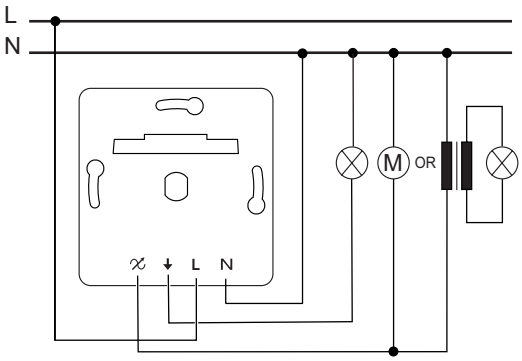
① Set the dimmer.
② Dim the brightness right down using the rotary knob.
③ Set the minimum brightness using the set-screw (MIN).

Operating the dimmer



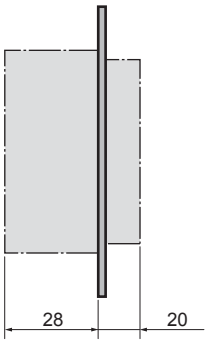
You switch the connected lamps on and off by simply pressing the rotary knob (A).
By turning the rotary knob (B), you dim the lamps brighter or darker.

Connections



⌇: controlled/dimmed output
↓ : ON/OFF output

Dimensions (mm)



Rotary push-button dimmers RC, 25-325 VA, two-way - SDN22007XX

Area of application

- Regulation of different loads (see load table) for homes and buildings.
- Suitable for renovation as it allows replacement of a switch or a 2-way switch by a regulator without having to change cables.
- As the regulator reduces the current supplying the load, it allows considerable energy savings.

Technical data

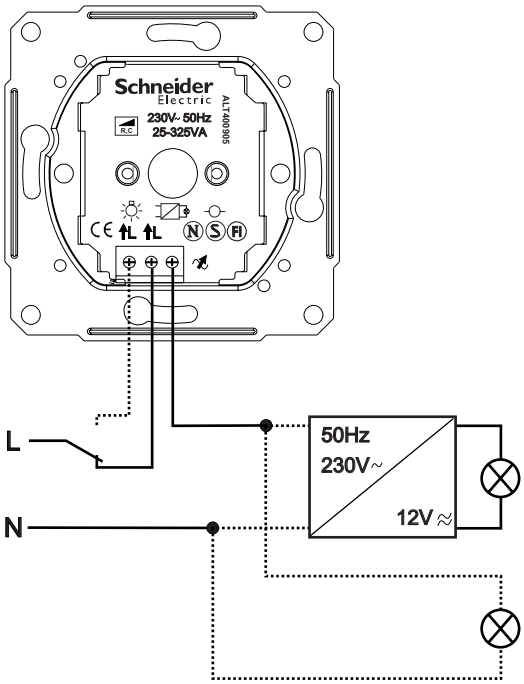
- Rated voltage: 230 V AC ± 10 %, 50 Hz,
- Possibility of connection with a two-way switch or just replace one-way switch,
- IP degree of protection: IP20,
- Conformity mark: CE,
- Standard: EN 60669-2-1.

Load table

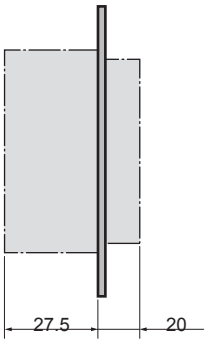
25°C 230 V 50 Hz	1	2	3	4
Max. Min.	325 W 25 W	325 W 25 W	NO	325 VA 25 VA

1 - Incandescent lamps
2 - Halogen lamps
3 - Low voltage halogen lamps with ferromagnetic transformer
4 - Low voltage halogen lamps with electronic transformers

Connections



Dimensions (mm)



Rotary push-button dimmers RL, 60-500 VA, two-way - SDN22005XX

Area of application

- Regulation of different loads (see load table) for homes and buildings.
- Suitable for renovation as it allows replacement of a switch or a 2-way switch by a regulator without having to change cables.
- As the regulator reduces the current supplying the load, it allows considerable energy savings.

Technical data

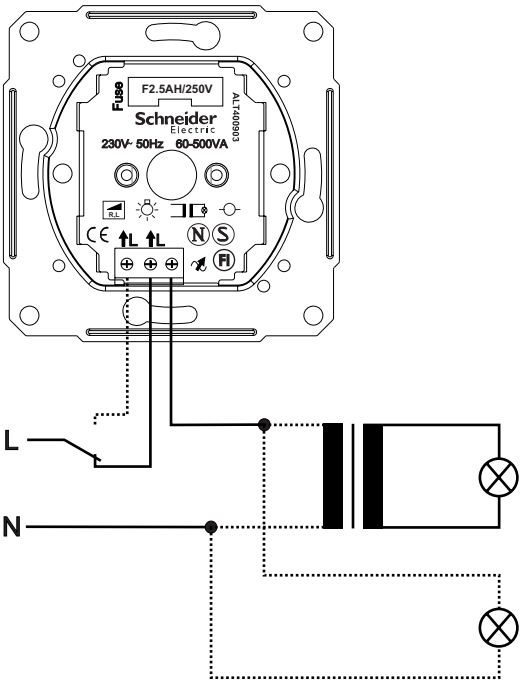
- Rated voltage: 230 V AC ± 10 %, 50 Hz,
- Possibility of connection with a two-way switch or just replace one-way switch,
- Fuse: 2,5 A(H)-230 V AC,
- IP degree of protection: IP20,
- Conformity mark: CE,
- Standard: EN 60669-2-1.

Load table

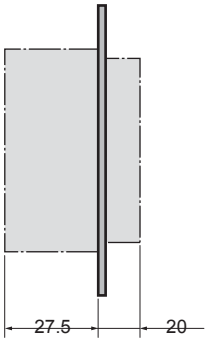
25°C 230 V 50 Hz	1	2	3	4
Max. Min.	500 W 60 W	500 W 60 W	500 VA 60 VA	NO

1 - Incandescent lamps
2 - Halogen lamps
3 - Low voltage halogen lamps with ferromagnetic transformer
4 - Low voltage halogen lamps with electronic transformers

Connections



Dimensions (mm)



Rotary push-button dimmers RL-RC, 230 V, 4-400 VA, two-way - SDN22012XX

Area of application

- Regulation of different loads (see load table) for homes and buildings.
- Suitable for renovation as it allows replacement of a switch or a 2-way switch by a regulator without having to change cables.
- As the regulator reduces the current supplying the load, it allows considerable energy savings.

Technical data

- Rated voltage: 230 V AC ± 10 %, 50 Hz,
- Possibility of connection with a two-way switch or just replace one-way switch,
- Switch type: 6 / 1,
- IP degree of protection: IP20,
- Conformity mark: CE,
- Standard: EN 60669-2-1,
- Product certification: FIMKO, NEMKO, SEMKO, VDE.

Load table

25°C 230 V 50 Hz	1	2	3	4	5	6
Max.	400 W	400 W	400 VA	400 VA	400 VA	200 VA
Min.	4 W	4 W	4 VA	4 VA	4 VA	40 VA

1 - Incandescent lamps
2 - Halogen lamps
3 - Low voltage halogen lamps with ferromagnetic transformer
4 - Low voltage halogen lamps with electronic transformers
5 - Low voltage halogen lamps with toroidal transformers
6- Led lamps

Use

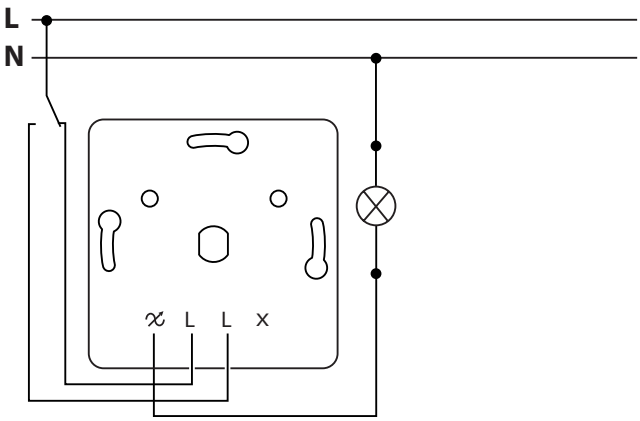
- Dimmer is installed into applicable flush or surface mounted installation box, connections according to the wiring diagram.
- Connected load type (resistive, capacitive and inductive) is detected and regulation algorithm is set automatically by the dimmer. The minimum and maximum light level setting is adjustable. Note: Device is not able to regulate capacitive and inductive loads simultaneously!
- The dimmer is designed using 2-wire topology so it can be used to replace a normal switch.
- Alternative connectors for phase-in (two-way switch used to control light from 2 points) are marked L, and regulated phase out has ⟋ -symbol. Xmarked connector is not connected internally to the dimmer and it can be used as extension joint. All connectors are applicable for 2 x 2,5mm² wires.
- **User interface**

Lights are switched ON / OFF by pushing the knob and light level is regulated by turning the knob. The dimmer uses soft start function when lights are switched ON.

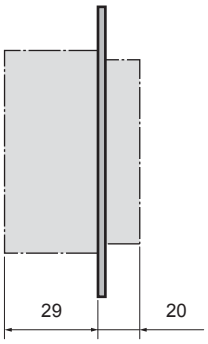
- **Protections**

The dimmer has electronic protection against the short circuit, over voltage, overload and overheat. If electronic protection has activated, to reset the dimmer for normal operation, push the knob. The dimmer also contains single shot thermal fuse.

Connections



Dimensions (mm)



Movement detectors SDN20002XX

Area of application

- The movement detection control switch switches on the loads, it controls when someone passes through the area of action of the sensor.
- It is suitable for different loads (see load table).
- The control switch allows considerable energy savings since the load is supplied only when people are present.

Technical data

- Voltage range: 230 V AC - 10% + 6%, 50 Hz,
- Main fuse: max 10 A,
- Wires/terminal: max 2 x 2.5 mm^2,
- Parallel connected units: max 10,
- Range: >10 m, >180°,
- Lux adjustment: ≈ 5 - ∞,
- Radio interference protection: CISPR 14,
- IP degree of protection: IP20,
- Conformity mark: CE,
- Standard: EN 60669-2-1.

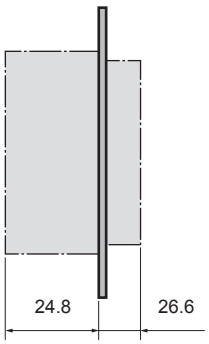
Load table

25°C 230 V 50 Hz	1	2	3	4	5	6	7
Max.	2300 W	2000 W	2000 VA*	1150 VA	1050 VA	500 VA	200 VA
Min.	1W	1W	1W	1W	1W	1W	1W

* max 140 µF, cos ø = 0,9

1 - Incandescent lamps
2 - 230 V halogen lamps
3 - Fluorescent tubes
4 - Electronic transformers
5 - Conventional transformers
6 - Energy saving lamps
7 - 1-phase motors

Dimensions (mm)

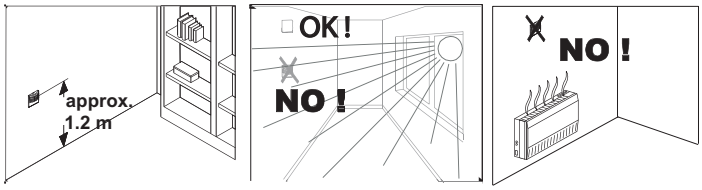


Use

- Neutral must be connected for device to function.
- Max. time delay 20 min – adjust the timer screw to its maximum extent clockwise.
- Device can be connected in parallel.

Important to remember

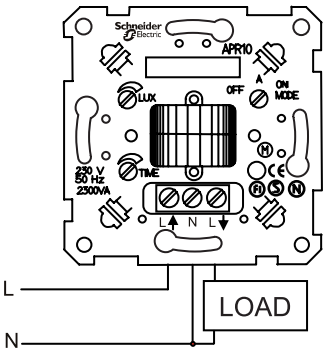
- Ensure that detector has free view.
- In the case of fluorescent tube load, a switched- on period of at least 10 min for the service life of the fluorescent tube is suitable.



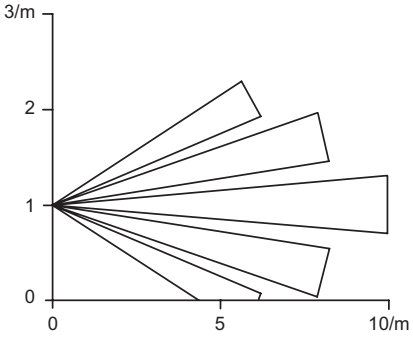
Manoeuvring

- A movement sensor reacts when a heat source (e.g. a person) moves within the area of the detector.
- Product has a switch marked 0-A-1:
  - In the 0 position, the movement sensor is entirely disconnected. In this position it is also possible to test the sensing area when a red LED lights inside the lens in conjunction with a movement.
  - In the A position, the movement sensor is in automatic mode.
  - In the 1 position it is always turned on.

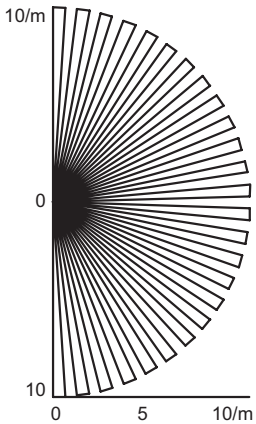
Connections



Detection areas



Vertical



Horizontal

Thermostat 10 A, room thermostat - SDN60001XX

Area of application

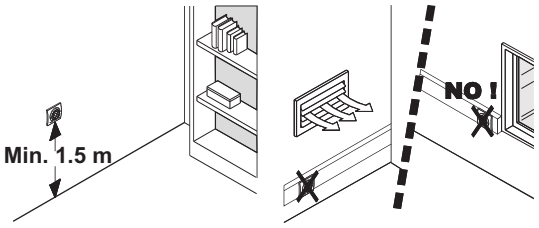
Electronic room thermostat is designed for controlling electric heaters like radiators and ceiling heaters.
Room thermosstat is easy to use and install. It includes ON/OFF switch in front panel and trimmer for temperature set point selection. It has one led to indicate when load is connected.
Thermostat full fills EN-60730-2-9 standard and it is RoHS and REACH compliant.

Technical data

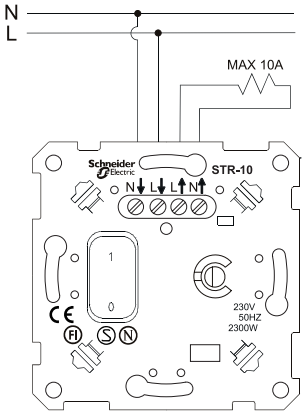
- Voltage range: 230 V ac ± 10 %, 50 Hz,
- Max fuse: 16 A,
- Maximum load: 2300 W (10 A, 230 V, cos φ = 1),
- Operation temperature: + 5 °C to + 30 °C,
- Temperature control range: + 5 °C to + 30 °C,
- Storage temperature: - 20 °C to + 60 ° C
- Control accuracy: 1 °C,
- 2-pole switch in front panel,
- Relay: NO (normally open),
- Led: red,
- Wires/terminal: max 2 x 2.5 mm^2
- Terminals have wire protectors (for multicore cables),
- IP degree of protection: IP20,
- Conformity mark: CE,
- Standard: EN 60669-2-1.

Use

- Put thermostat ON/OFF from the switch in front panel.
- Red light indicates that heating is active.
- Adjusting scale indicates suggestive temperature and suitable temperature should be measured by experience.

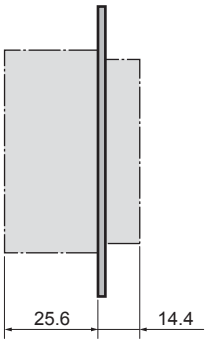


Connections



Put thermostat to a mounting box so that connectors are up.
If connection has protective earth (PE) wires use external connectors to connect them together.
Thermostat doesn't have terminals for PE.

Dimensions (mm)



Thermostat 10 A, floor thermostat - SDN60003XX

Area of application

Electronic floor thermostat is designed for floor heating cables and other floor heating applications.
Floor thermostat is easy to use and install. It includes ON/OFF switch in front panel and trimmer for temperature set point selection. It has one led to indicate when load is connected.
Thermostat full fills EN-60730-2-9 standard and it is RoHS and REACH compliant.

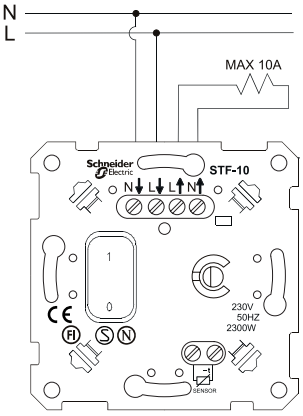
Technical data

- Voltage range: 230 V ac ± 10 %, 50 Hz,
- Max fuse: 16 A,
- Maximum load: 2300 W (10 A, 230 V, cos φ = 1),
- Wires/terminal: max 2 x 2,5 mm^2,
- Operation temperature: + 5 °C to + 50 °C,
- Storage temperature: - 20 °C to + 50 °C,
- Temperature control range: + 5 °C to + 50 °C,
- Control accuracy: 1 °C,
- 2-pole switch in front panel,
- Relay: NO (normally open),
- Led: red,
- Terminals have wire protectors (for multicore cables),
- External sensor (attached) 4,0 m double isolated, NTC 10 kΩ at 25 °C,
- IP degree of protection: IP20,
- Conformity mark: CE,
- Standard: EN 60730-2-9.

Use

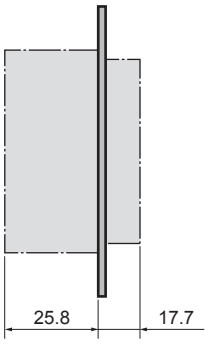
- Put thermostat ON/OFF from the switch in front panel.
- Red light indicates that heating is active. Warming of the floor takes several hours.
- Adjusting scale indicates suggestive temperature and suitable temperature should be measured by experience.

Connections



Put thermostat to a mounting box so that connectors are up.
If connection has protective earth (PE) wires use external connectors to connect them together.
Thermostat doesn't have terminals for PE.

Dimensions (mm)



Thermostat 10 A, room thermostat with cooling mode - SDN60011XX

Area of application

Bimetal thermostat with cooling mode can be used to control both heating or cooling systems in dry and closed spaces, such as flats, schools, halls, workshops, etc.

Technical data

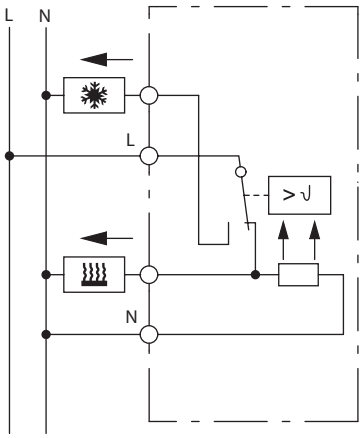
- Nominal voltage: 230 V AC
- Temperature adjustment range: 5-30°C
- Nominal current
  - Heating: 10 A resistive and 4 A inductive loads,
  - Cooling: 5 A resistive load and 2 A inductive loads,
- Switching capacity:
  - Heating: 2.2 kW
  - Cooling: 1.1 kW
- Differential gap: approx. 0.5 K
- Maximum humidity: 95 %, no condensation,
- IP degree of protection: IP20,
- Conformity mark: CE,
- Standard: EN 60730-2-9.

Standards

The inserts is interference-suppressed in accordance with EN 55014 and operates according to operating principles 1C.

Connections

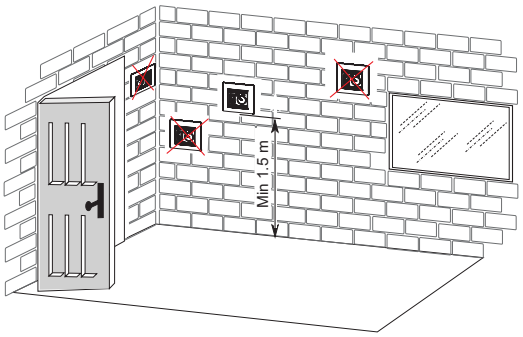
Circuit diagram



Heating

Cooling

Use

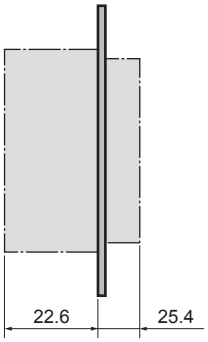


- Installation on interior walls opposite the heat source is preferable
- Mounting height: approx. 1.5 m above the floor
- External walls and draughts from windows and doors should be avoided
- Ensure that the warm air in the room has free access to the controller. Therefore, the controller should not be installed inside shelving units or behind curtains and similar coverings
- External heat affects the accuracy of the control unit adversely. Therefore, avoid direct sunlight, proximity to televisions, radio and heating appliances, lamps, chimneys and heating pipes
- A dimmer also generate heat. If a controller is installed with a dimmer in a shared switch frame, the two should be as far as possible. If they are arranged one on the top of the other, the controller must be below the dimmer.

Commissioning the room temperature control unit

When commissioning the room temperature control unit be aware that the bimetallic element needs time to adjust to the room temperature. Therefore the switching point will deviate from the room temperature directly after installation or after night economy is switched off. The switching points becomes accurate after approx. 1 or 2 hours of operating time.
We therefore recommend an initial set temperature that is higher than actually so that initial heating and initial temperature equalisation are faster. After the desired temperature has been reached the temperature setting can be set to the setpoint value required.
Use the setting knob to set the temperature required. The scale corresponds to a temperature range of approx. 5 - 30°C.

Dimensions (mm)

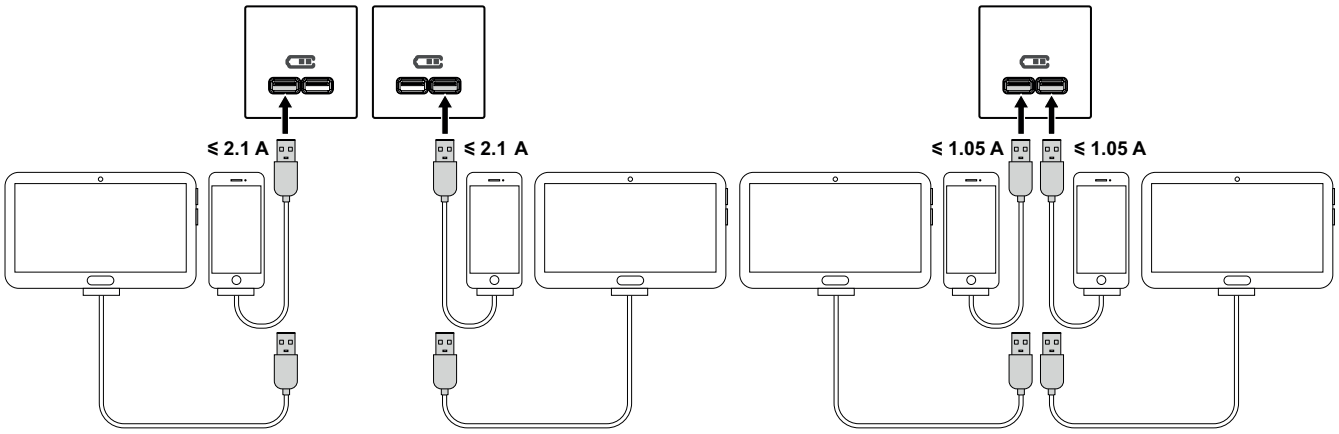


USB chargers

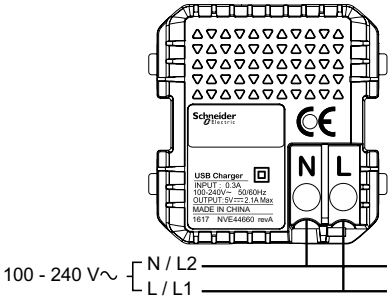
Area of application

USB chargers allow you to quickly charge the battery of a portable device without a mobile charger

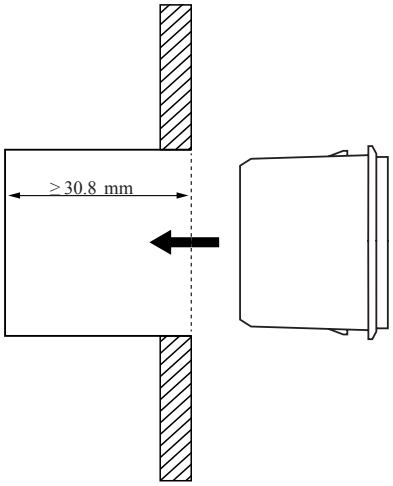
Use



Connection



Embedding depth



Key card switch SDN19001XX

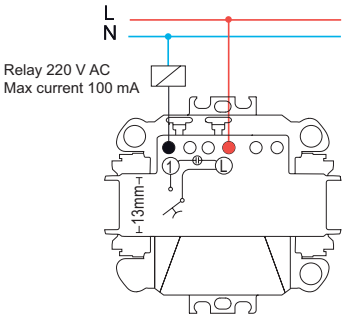
Area of application

- Particularly recommended for hotel rooms.
- Controls lighting circuits, electrical appliances, electronic equipment, etc.

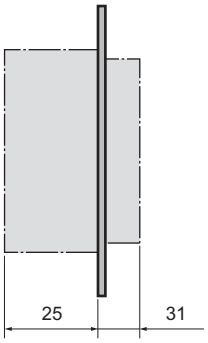
Technical data

- IP degree of protection: IP20,
- Conformity mark: CE,
- Standard: EN 60669-1,
- Product certifications: S, N, FI.

Connections



Dimensions (mm)



RJ45 data sockets

Area of application

● Given the rapid evolution of the world of computing and telecommunications, today installation of networks is essential in offices and shops (and soon in homes) in order to share information and equipment (printers, scanners, etc.) between several computers.
● These networks consist of cables, connectors, centralising systems and other accessories that, installed in standard, flexible and upgradeable manner (for all Voice, Data, Image transmission applications), make up what is known as structured cabling system.
● The main component of structured cabling is the cable. There are different types of cable for data networks (coaxial, optical fibre, etc.), but the cable most commonly used is the twisted pair cable consisting of 2 insulated and interlaced copper wires.
● There are several types of twisted pair cables:
○ the U/UTP cable (Unshielded Twisted Pair) is a 4-pair twisted cable that is not shielded. It is intended for small and medium installations without electromagnetic pollution
○ the F/UTP cable (Foiled Twisted Pair) is a 4-pair twisted cable with general shielding for external protection, common to all 4 pairs, protecting them against reduced electromagnetic pollution. It is suitable for installations requiring minimum electromagnetic protection
○ the S/FTP cable (Shielded Twisted Pair) is also another 4-pair shielded twisted cable with protective shielding of each pair against high electromagnetic pollution. This minimises emissions. It is suitable for installations requiring a high level of electromagnetic protection.
● The RJ45 socket is an 8-pin connector standardised by ISO8877 for connection of devices to VDI networks.
● One of the standards most commonly used for production of structured cabling is that of the North American Association of electronic and telecommunications manufacturers (EIA/TIA 568B) that has defined a colour code with 2 alternatives, to describe connection of the RJ45 connector.

Technical data

Categories

● The most important property defining a data network is the speed at which information can circulate inside this network.
● According to this aspect, installations are classed into the following categories:

Category	Transmission rate	Network type
Cat. 3	Up to 10 MHz	Ethernet 10 Base T, Token Ring 4 Mbps
Cat. 4	Up to 16 MHz	Token Ring 16 Mbps
Cat. 5e	Up to 100 MHz	Ethernet 1000 Base T, ATM 155 Mbps
Cat. 6	Up to 250 MHz	Ethernet 1000 Base T, ATM 1200
Cat. 6_A	Up to 500 MHz	Ethernet full-duplex mode 1000 Base T

● So that an installation can be included in a certain category, all the elements making it up must belong to the same category, or, otherwise, it will be classed in the category of the lower category element.

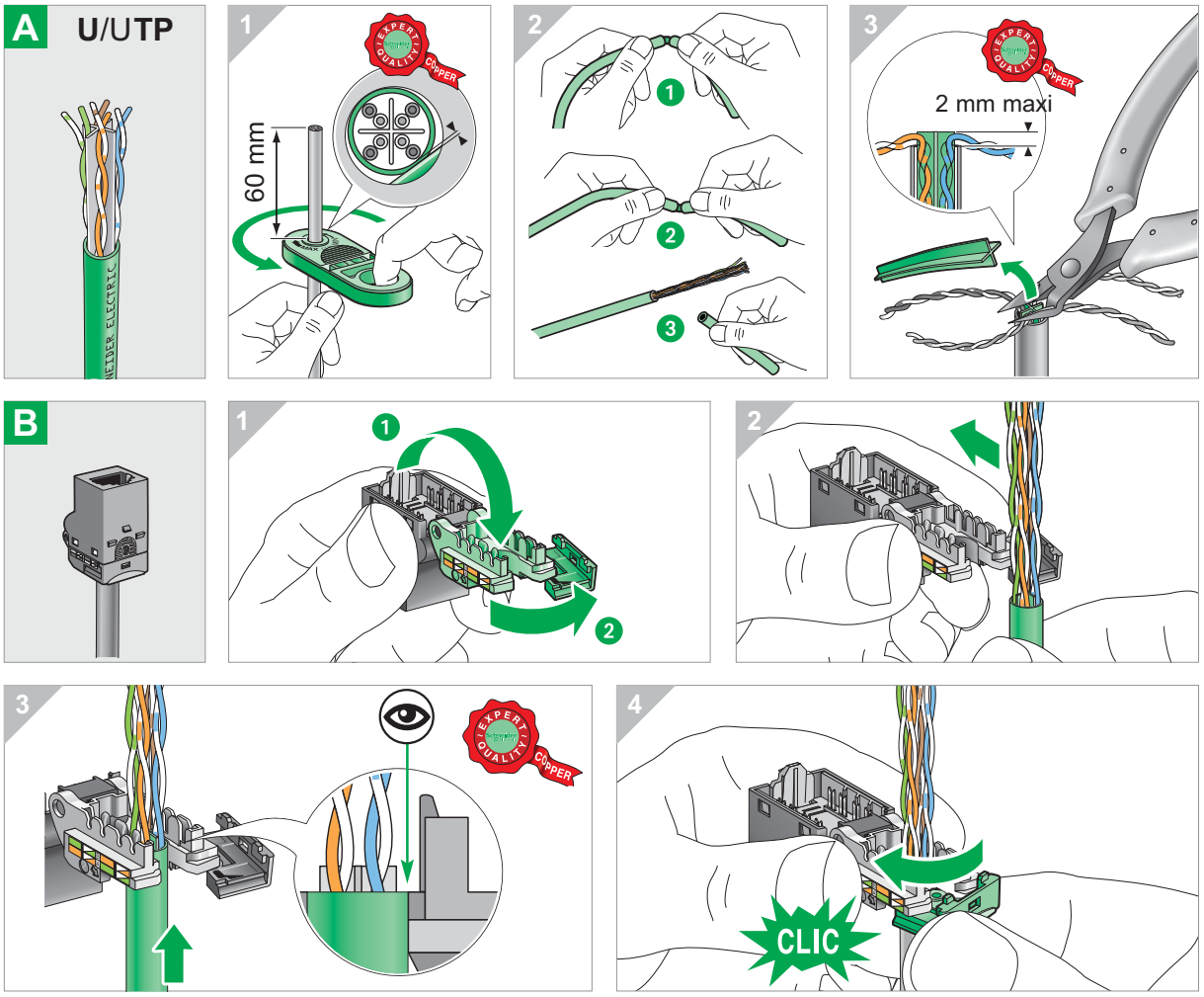
Sedna offer

● The Sedna offer consists of supports for RJ45 connectors and of a broad and comprehensive range.
● This offer satisfies the technical requirements of prevailing regulations soon to be standardised and stand out by the following characteristics:
○ ease of mounting: each connector is equipped with a code of colours and numbers to guide connection at all times without needing special tools
○ high connector quality with category 6 and 6 sockets thus allowing us to propose the quickest connector on the market
○ minimum conductor untwisting for connection, thus preventing electromagnetic interference
○ connection reliability
○ compact size (particularly for the shielded version).

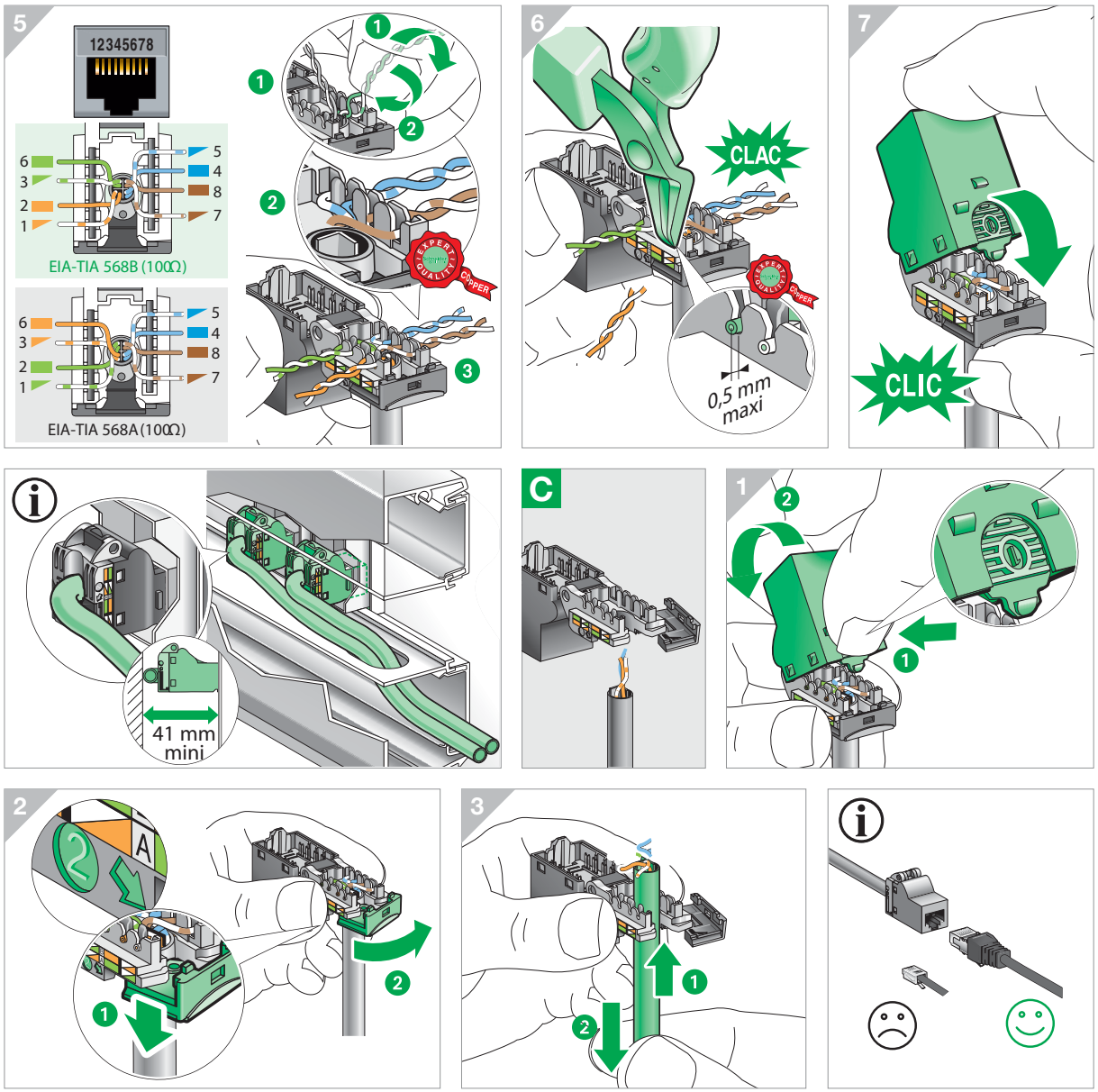
RJ45 data sockets (cont'd)

Installation

Example of unshielded data socket installation (cat 6A, 5, 5e)



RJ45 data sockets (cont'd)



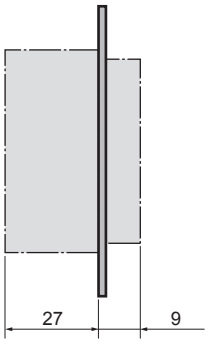
TV/R/SAT outlets

Area of application

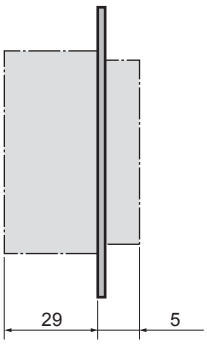
Antenna sockets are adapted for connection of radio and television receivers, with land-based or satellite-based analog and digital signals.

Dimensions (mm)

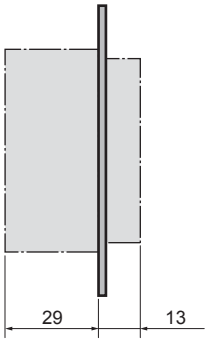
TV connector



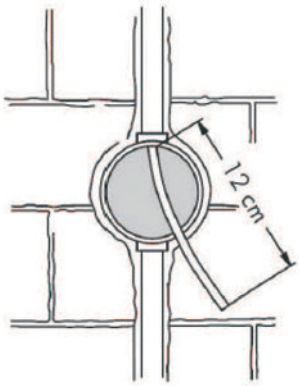
TV/R outlet

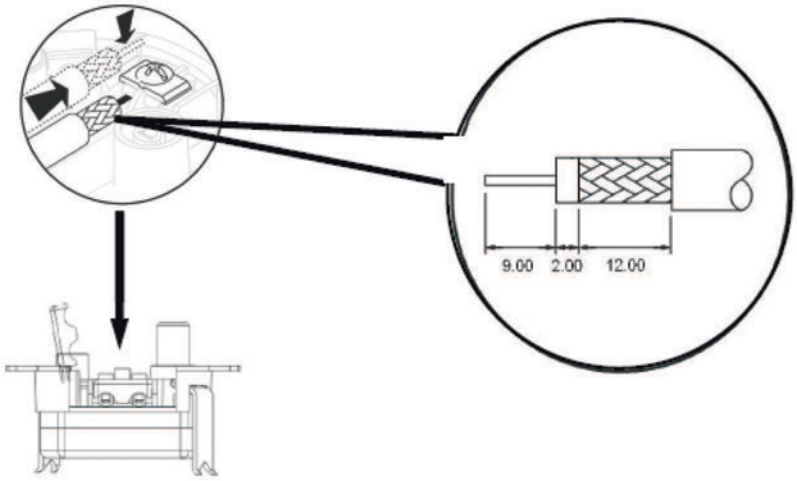


TV/SAT outlet
TV/R/SAT outlet
R-TV/SAT/SAT outlet



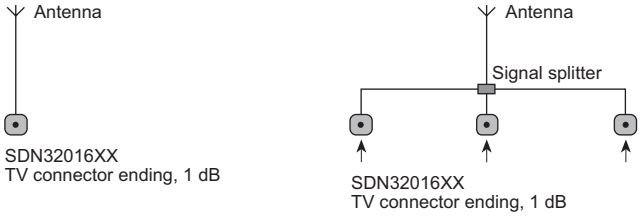
Installation



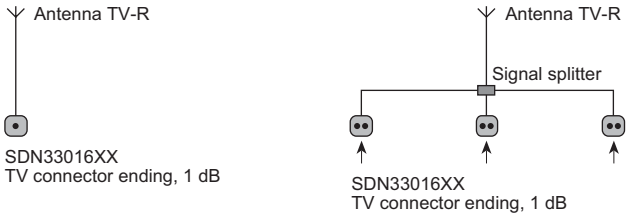


TV/R/SAT outlets

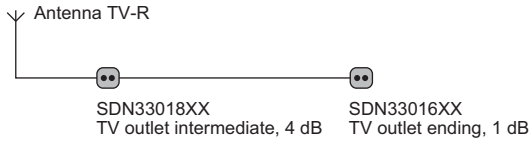
TV: individual / parallel installation insert

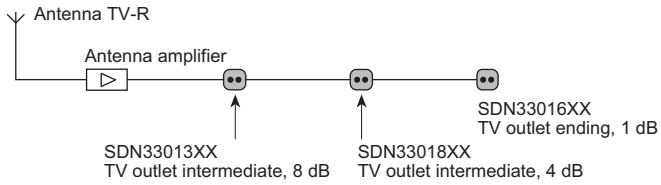


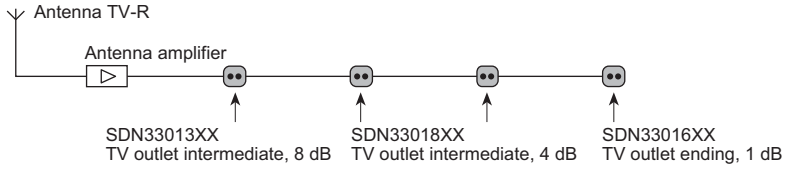
TV/R: individual / parallel installation insert

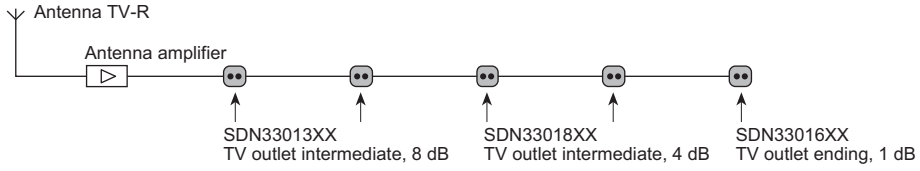


TV/R: linear installation insert

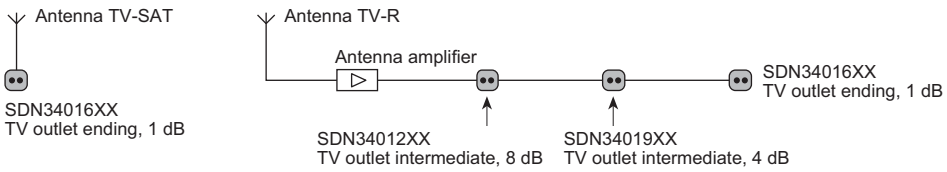








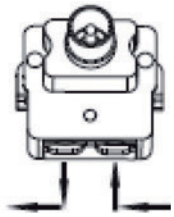
TV/SAT: individual / linear installation insert



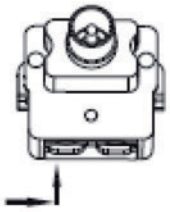
TV/R/SAT outlets

Connections

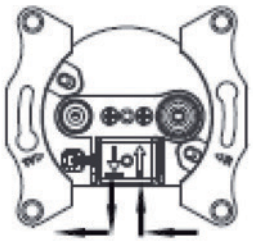
TV connector, intermediate



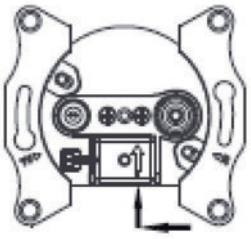
TV connector, ending



TV/R outlet, intermediate



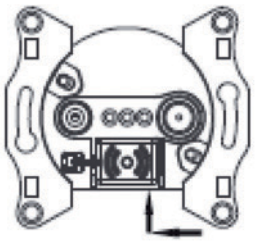
TV/R outlet, ending



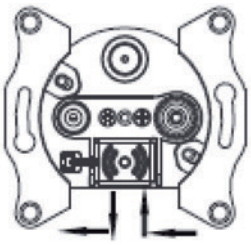
TV/SAT outlet, intermediate



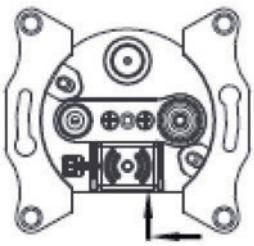
TV/SAT outlet, ending



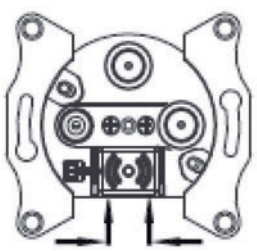
TV/R/SAT outlet, intermediate



TV/R/SAT outlet, ending



TV/SAT/SAT outlet, ending



Technical data

TV connector

		SDN32018XX	SDN32012XX	SDN32016XX
		Intermediate	Intermediate	Ending
Loss (dB)		-	-	-
Operating frequency (MHz)		5-862	5-862	5-862
Output loss (dB)		4	8	1
Through loss (dB)		-	-	-

TV/R outlets

		SDN33018XX	SDN33013XX	SDN33016XX
		Intermediate	Intermediate	Ending
Loss (dB)		4	8	-
Operating frequency (MHz)	TV	5-862	5-862	5-862
	R	88-125	88-125	88-125
Output loss (dB)	TV	4	8	1
	R	10	10	10
Through loss (dB)		1	1	-

TV/SAT outlets

		SDN34019XX	SDN34012XX	SDN34016XX
		Intermediate	Intermediate	Ending
Loss (dB)		4	8	-
Operating frequency (MHz)	SAT	950-2400	950-2400	950-2400
	TV	5-862	5-862	5-862
Output loss (dB)	SAT	3	3	1
	TV	4	8	1
Through loss (dB)		1	1	-

TV/R/SAT outlets

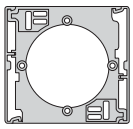
		SDN35014XX	SDN35012XX	SDN35013XX
		Intermediate	Intermediate	Ending
Loss (dB)		4	8	-
Operating frequency (MHz)	SAT	950-2400	950-2400	950-2400
	TV	5-862	5-862	5-862
	R	88-125	88-125	88-125
Output loss (dB)	SAT	3	3	1
	TV	4	8	1
	R	10	10	10
Through loss (dB)		1	1	-

TV/SAT/SAT outlets

		SDN35021XX
		Ending
Loss (dB)		-
Operating frequency (MHz)	SAT1	5-2400
	SAT2	950-2400
	TV	5-862
Output loss (dB)	SAT1	1
	SAT2	1
	TV	1
Through loss (dB)		-

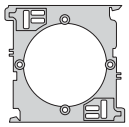
Horizontal surface mounting Boxes

Multi gang

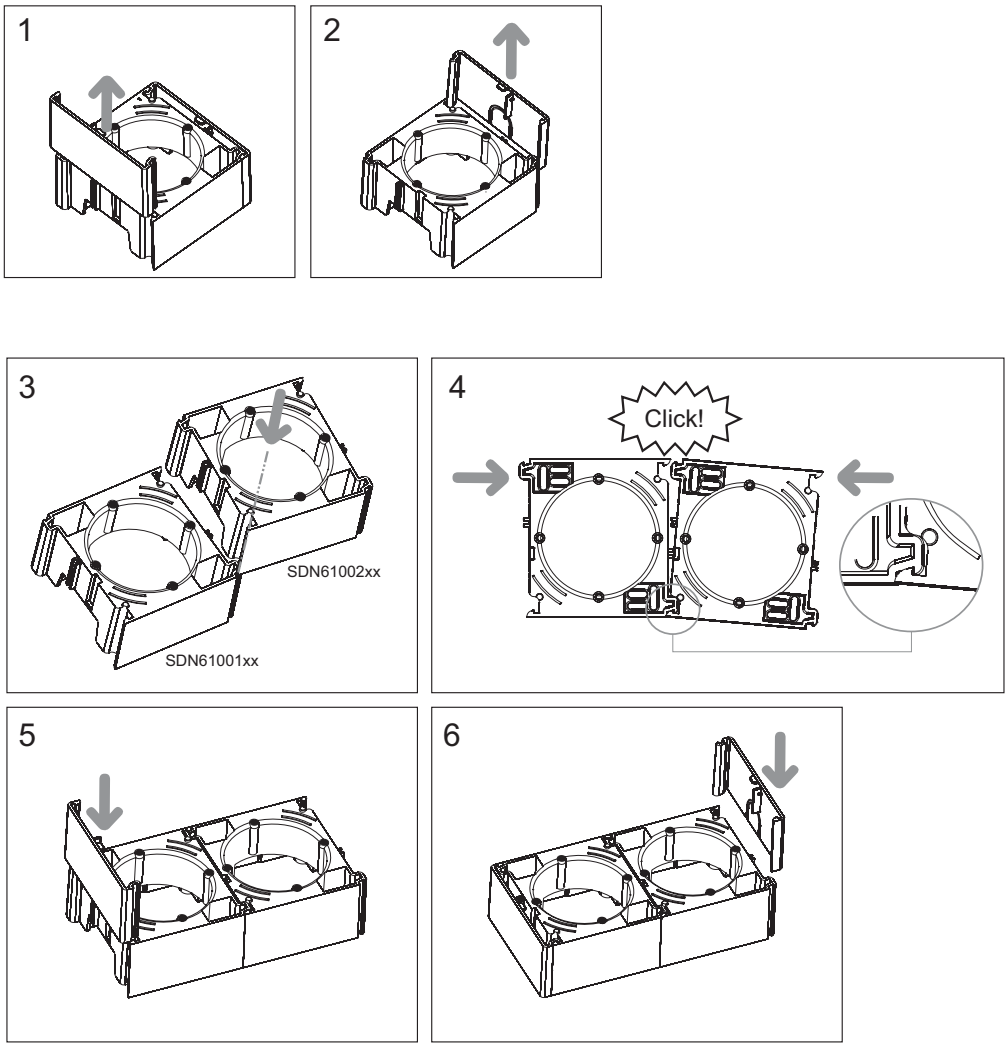


One gang
SDN61001xx

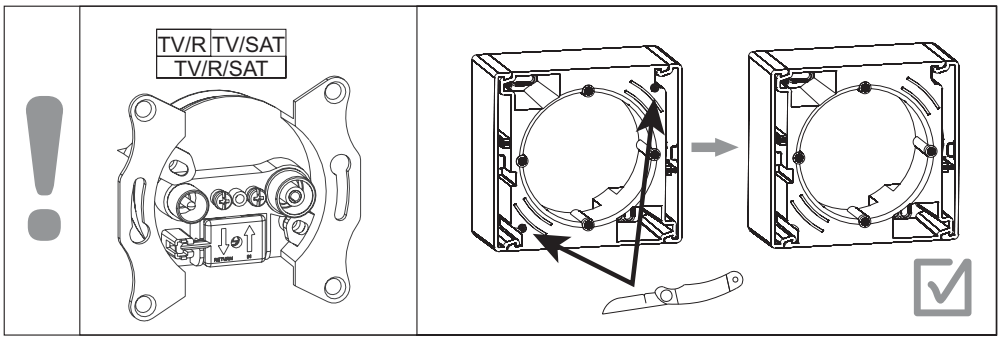
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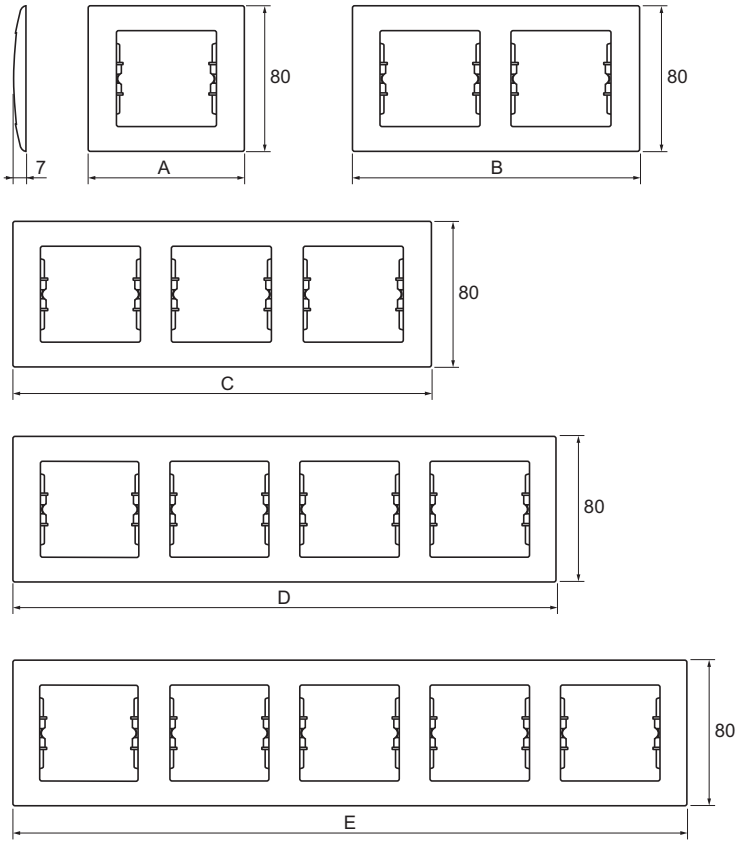
Multi gang
SDN61002xx

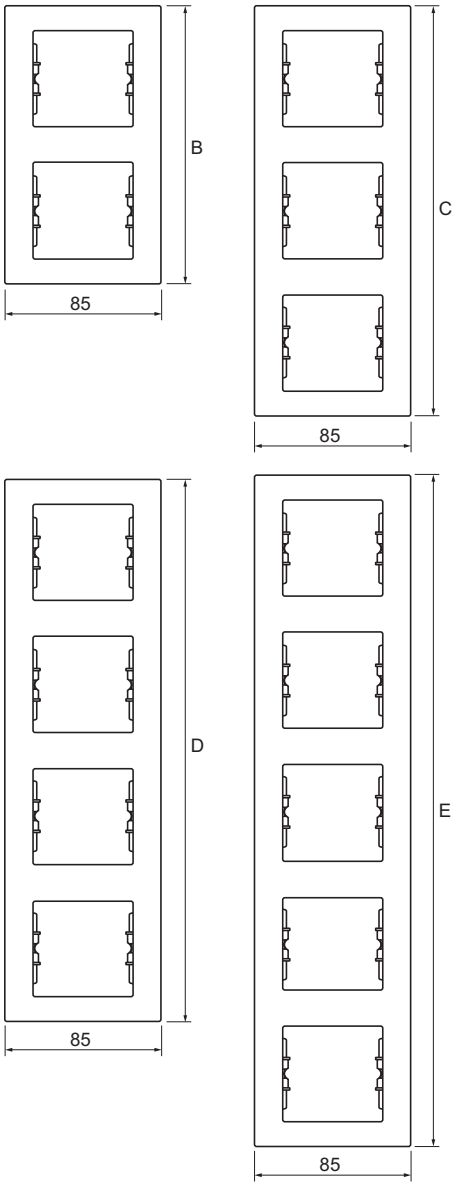


For TV/R, TV/SAT or TV/R/SAT outlets



Cover frames dimensions (mm)





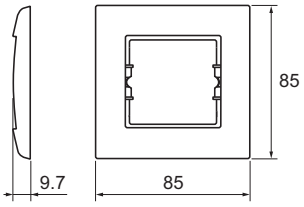
Horizontal frame

1 gang	2 gang	3 gang	4 gang	5 gang
A (mm)	**B** (mm)	**C** (mm)	**D** (mm)	**E** (mm)
85	156	227	299	370

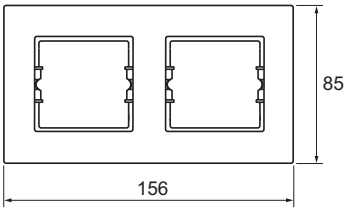
Vertical frame

2 gang	3 gang	4 gang	5 gang
B (mm)	**C** (mm)	**D** (mm)	**E** (mm)
151	222	294	365

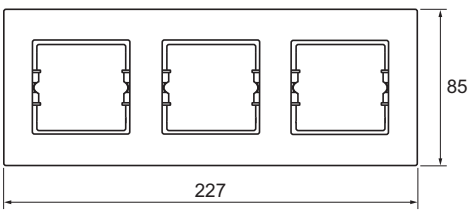
1 gang IP44 frame for IP44 switch or IP20 socket-outlet



2 gang IP44 frame for IP44 switch or IP20 socket-outlet



3 gang IP44 frame for IP44 switch or IP20 socket-outlet



Reference number overview

Ref	Pages
SDN0100121	18
SDN0100123	18
SDN0100147	18
SDN0100160	18
SDN0100168	18
SDN0100170	18
SDN0100321	19
SDN0100323	19
SDN0100347	19
SDN0100360	19
SDN0100368	19
SDN0100370	19
SDN0200121	18
SDN0200123	18
SDN0200147	18
SDN0200160	18
SDN0200168	18
SDN0200170	18
SDN0200221	19
SDN0200223	19
SDN0200247	19
SDN0200260	19
SDN0200268	19
SDN0200270	19
SDN0200321	19
SDN0200323	19
SDN0200347	19
SDN0200360	19
SDN0200368	19
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SDN0201160	20
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SDN0201170	20
SDN0201221	21
SDN0201223	21
SDN0201247	21
SDN0201260	21
SDN0201268	21
SDN0201270	21
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SDN0300123	18
SDN0300147	18
SDN0300160	18
SDN0300168	18
SDN0300170	18
SDN0300321	20
SDN0300323	20
SDN0300347	20
SDN0300360	20
SDN0300368	20
SDN0300370	20
SDN0300421	19
SDN0300423	19
SDN0300447	19
SDN0300460	19
SDN0300468	19
SDN0300470	19

Ref	Pages
SDN0400121	18
SDN0400123	18
SDN0400147	18
SDN0400160	18
SDN0400168	18
SDN0400170	18
SDN0400321	20
SDN0400323	20
SDN0400347	20
SDN0400360	20
SDN0400368	20
SDN0400370	20
SDN0400421	19
SDN0400423	19
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TV CABLE SOCKET OUTLET F TYPE CONNECTOR
(for screw mounting only)

Art. G185



FRAME FOR SOCKET OUTLET
(Flush mounting type)

Fancy Pink	(G151 - 502)
Hawaiian Blue	(G151 - 504)
Sweet Purple	(G151 - 506)
Champagne Gold	(G151 - 507)
Silver Metalic	(G151 - 509)



BRITISH STANDARD SOCKET OUTLET WITH SWITCH, INDICATOR LAMP AND CHILD PROTECTION

Art. G155
13A 250V~
Available in Snow White color only

SURFACE MOUNTING TYPE

All range of flush mounting type also available in surface mounting type.



SURFACE MOUNTING BOX

Art. 4101-535 SD
Available in Snow White color only



AC SET BRITISH STANDARD SOCKET OUTLET WITH SWITCH, INDICATOR LAMP AND CHILD PROTECTION

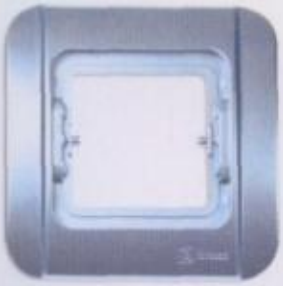
Art. G155 Set
13A 250V~
Available in Snow White color only



BRITISH STANDARD SOCKET OUTLET WITH SWITCH, INDICATOR LAMP AND CHILD PROTECTION

Art. G155 SM
13A 250V~
Available in Snow White color only

FRAME



FRAME FOR SWITCH
(Flush mounting type)

Fancy Pink	(G161 - 502)
Hawaiian Blue	(G161 - 504)
Sweet Purple	(G161 - 506)
Champagne Gold	(G161 - 507)
Silver Metalic	(G161 - 509)



AC SET BRITISH STANDARD SOCKET OUTLET WITH SWITCH, INDICATOR LAMP AND CHILD PROTECTION

Art. G155 SM Set
13A 250V~
Available in Snow White color only

Introducing Galleo the most colourful & refreshing switches & sockets.
Galleo is the perfect choice to support your interior atmosphere because Galleo available in 6 sparkling colors.
Galleo also has simple and modern look and all articles are supplied as complete units.
Choose Galleo and make your home more colourful and refreshing.

COLORS AVAILABLE :



Fancy Pink
(52)



Hawaiian Blue
(54)



Snow White
(55 S)



Sweet purple
(56)



Champagne Gold
(57)



Silver Metallic
(59)

SAMBUNGAN & PIPA *uPVC*

RUCIKA®

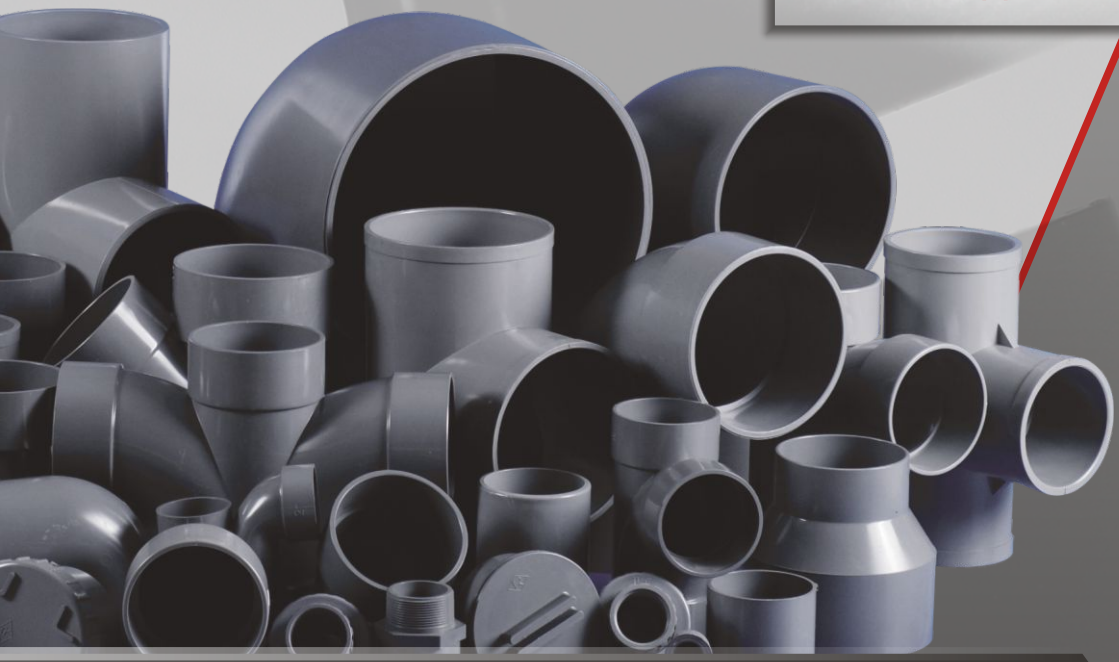
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TOP BRAND 2012

Sambungan

Paling Lengkap!

untuk semua pipa *uPVC*



Sambungan & Pipa *uPVC* Standard JIS Untuk Aplikasi Air Bersih & Air Buangan

www.wavin.co.id

Sambungan

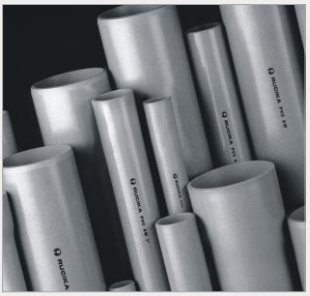
Paling Lengkap !

untuk semua pipa *uPVC*

Dengan penetrasi sistem pipa *uPVC* kedalam pasaran perpipaan air, **RUCIKA** Standard JIS telah dikembangkan untuk memenuhi kebutuhan instalasi pipa air minum di rumah-rumah maupun gedung bertingkat sejak lebih dari 30 tahun yang lalu. **RUCIKA** Standard JIS memiliki berbagai macam jenis sambungan / fitting dengan jenjang produk pipa yang lengkap, sehingga sangat cocok apabila digunakan pada instalasi air bersih, air hujan, air kotor dan pipa ventilasi udara.







Keunggulan dan Manfaat

Standard JIS
Memenuhi standard *Japanese Industrial Standard* (JIS) yang mengaplikasikan standard beserta metoda pengujian untuk menjamin kualitas produk sambungan / fitting dan pipa **RUCIKA**.

Mengunakan Aditif Khusus
Dapat mereduksi pengaruh UV (*Ultra Violet)* terhadap sambungan / fitting dan pipa dalam jangka waktu yang lama.

Tahan Terhadap Bahan Kimia Ekstrim
Dapat digunakan pada kondisi asam dan basa.

Dapat Digunakan Untuk Berbagai Jenis Sistem Air Bersih dan Air Buangan
RUCIKA diproduksi dalam 2 type, yaitu *type* VP / AW untuk aplikasi air bertekanan dan VU / D untuk aplikasi air tidak bertekanan.

Dapat Didaur Ulang
Terbuat dari *uPVC* yang bersifat *thermoplastic* sehingga dapat didaur ulang.

Memiliki Beraneka Ragam Sambungan / Fitting
Menjamin instalasi terpasang dalam satu sistem.

Kuat dan Tidak Mudah Pecah
Karena mengandung resin *uPVC* dan aditif yang diformulakan secara khusus berdasarkan pengalaman lebih dari 30 tahun.

Tahan Lama
Tidak dapat berkarat dan bebas pemeliharaan.

Termasuk Isolator Yang Baik dan Tidak Dapat Menimbulkan Api
Dapat digunakan untuk selubung kabel listrik.



Jenjang Produk

Pipa **RUCIKA** dapat diklasifikasikan menjadi 2 (dua) kelompok :

1. Kelas VP / AW, untuk air bertekanan tinggi sampai tekanan kerja 10 kg/cm^2 dengan 14 macam ukuran diameter dari 1/2 inch sampai 12 inch.
2. Kelas VU / D, untuk saluran pembuangan dan limbah dengan 10 macam ukuran diameter dari 1-1/2 inch sampai 12 inch.

Kedua kelompok tersebut tersedia dalam panjang standard 4 meter.

KELAS VP / AW (Pipa bertekanan, dengan tekanan maksimal : 10 kg/cm^2)

Diameter		Tebal Dinding (mm)	Panjang (m)	Sistem Penyambungan
inch	mm			
1/2	22	2,70	4	SP
3/4	26	2,70	4	SP
1	32	3,10	4	SP
1-1/4	42	3,10	4	SP
1-1/2	48	3,60	4	SP
2	60	4,10	4	SP
2-1/2	76	4,10	4	SP
3	89	5,50	4	SP
4	114	6,60	4	SP
5	140	7,00	4	SP
6	165	8,90	4	SP
8	216	10,30	4	SP
10	267	12,70	4	SP
12	318	15,10	4	SP

KELAS VU / D (Pipa non bertekanan, dengan tekanan maksimal : 5 kg/cm^2)

Diameter		Tebal Dinding (mm)	Panjang (m)	Sistem Penyambungan
inch	mm			
1-1/2	48	1,80	4	SP
2	60	1,80	4	SP
2-1/2	76	2,20	4	SP
3	89	2,70	4	SP
4	114	3,10	4	SP
5	140	4,10	4	SP
6	165	5,10	4	SP
8	216	6,50	4	SP
10	267	7,80	4	SP
12	318	9,20	4	SP

SP : Spigot Ended

Physical Properties

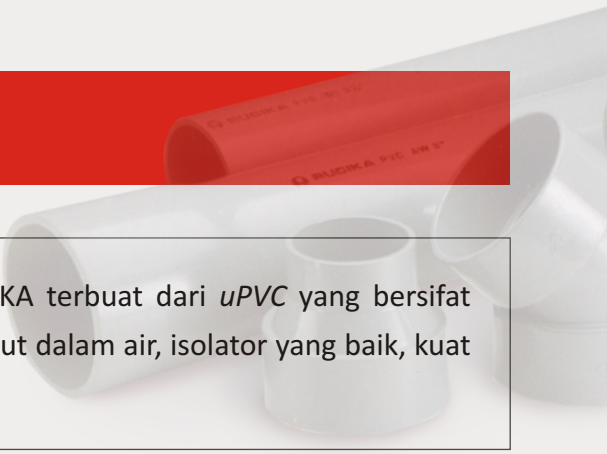
Specific gravity	= 1,40 g/cm^3
Coefficient of linear expansion	= 8 x 10^{-2} mm/m.°K
Thermal conductivity	= 0,15 W/m.°K
Modulus of elasticity	= 3000 N/mm^2
Surface resistance	> 10^{12} Ohm

Aplikasi Sistem

Sambungan / fitting dan pipa *uPVC* **RUCIKA** sesuai untuk aplikasi :

- Instalasi saluran pipa air bersih
- Instalasi saluran pipa pembuangan
- Instalasi saluran pipa limbah
- Instalasi saluran pipa irigasi
- Instalasi jalur pipa ventilasi

Karakteristik Bahan



Sambungan / fitting dan pipa RUCIKA terbuat dari *uPVC* yang bersifat *thermoplastic*, tidak korosif, tidak larut dalam air, isolator yang baik, kuat dan ringan

Standard Kualitas

- JIS K 6739:2007 *Unplasticized poly (vinyl chloride) (PVC-U) pipe fittings for drain*
- JIS K 6741:2007 *Unplasticized poly (vinyl chloride) (PVC-U) pipes*
- JIS K 6742:2007 *Unplasticized poly (vinyl chloride) (PVC-U) pipes for water supply*
- JIS K 6743:2007 *Unplasticized poly (vinyl chloride) (PVC-U) pipe fittings for water supply*

Proses Penyambungan

1. Bersihkan kotoran pada permukaan *spigot* dan *socket.*
2. Ukur kedalaman *socket* dan beri tanda dengan spidol pada *spigot*.
3. Oleskan secukupnya Lem Pipa *uPVC* pada permukaan *spigot* dan *socket*.
4. Sambungkan dengan segera dan posisi sambungan ditahan sesaat agar tidak berubah.
5. Bersihkan sisa kelebihan Lem Pipa *uPVC* pada permukaan *spigot* dan *socket*.











SAMBUNGAN / FITTING RUCIKA STANDARD JIS K-6743 UNTUK APLIKASI AIR BERSIH BERTEKANAN

UNION SOCKET (AW)



UKURAN	ISI / BOX
1/2”	110
3/4”	72
1”	54
1-1/4”	30
1-1/2”	18

UNION THREAD (AW)



UKURAN	ISI / BOX
1/2”	110
3/4”	72
1”	54
1-1/4”	30
1-1/2”	18

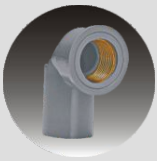
FAUCET ELBOW (AW)



UKURAN	ISI / BOX
1/2"	200
1/2" x 3/4"	175
3/4"	130
1"	85

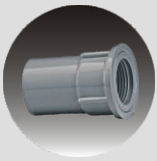
FAUCET ELBOW (AW)

with Metal Insert



UKURAN	ISI / BOX
1/2”	200 (4@50pcs)
3/4”	120 (4@30pcs)

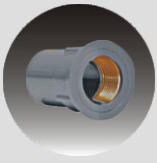
FAUCET SOCKET (AW)



UKURAN	ISI / BOX
1/2"	300
1/2" x 3/4"	200
3/4"	180
1" x 1/2"	140
1" x 3/4"	130
1"	120
1-1/4"	60
1-1/2"	40
2"	25

FAUCET SOCKET (AW)

with Metal Insert



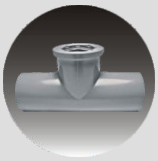
UKURAN	ISI / BOX
1/2”	240 (4@60pcs)
3/4”	160 (4@40pcs)

Y-BRANCH (AW)



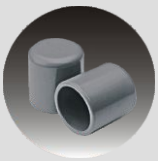
UKURAN	ISI / BOX
8” x 8”	2

FAUCET TEE (AW)



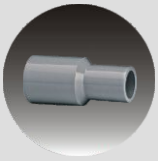
UKURAN	ISI / BOX
1/2”	140
1/2” x 3/4”	100
3/4”	85

CAP (AW)



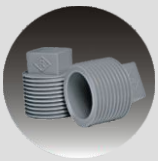
UKURAN	ISI / BOX
1/2”	500
3/4”	400
1”	250
2”	54
3”	48
4”	18
6”	8
8”	3

REDUCING SOCKET (AW)



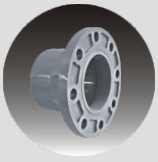
UKURAN	ISI / BOX
3/4” x 1/2”	225
1” x 1/2”	215
1” x 3/4”	150
1-1/4” x 1/2”	110
1-1/4” x 3/4”	110
1-1/4” x 1”	110
1-1/2” x 1/2”	72
1-1/2” x 3/4	65
1-1/2” x 1”	65
1-1/2” x 1-1/4”	45
2” x 1/2”	45
2” x 3/4”	45
2” x 1”	40
2” x 1-1/4”	45
2” x 1-1/2”	40
3” x 2”	16
4” x 1-1/2”	18
4” x 2”	18
4” x 3”	18
6” x 3”	5
6” x 4”	5
6” x 5”	5
8” x 4”	4
8” x 5”	2
8” x 6”	2
10” x 8”	2

PLUG (AW)



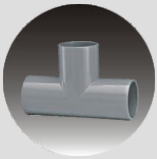
UKURAN	ISI / BOX
1/2”	1200 (12@100pcs)
3/4”	700 (7@100pcs)

FLANGE (AW)



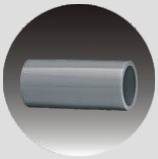
UKURAN	ISI / BOX
2”	31
3”	15
4”	12
6”	8

TEE (AW)



UKURAN	ISI / BOX
1/2"	150
3/4" x 1/2"	100
3/4"	100
1" x 1/2"	65
1" x 3/4"	65
1"	60
1-1/4" x 1/2"	45
1-1/4" x 3/4"	45
1-1/4" x 1"	35
1-1/4"	30
1-1/2" x 1/2"	25
1-1/2" x 3/4"	24
1-1/2" x 1"	24
1-1/2" x 1-1/4"	20
1-1/2"	20
2" x 1/2"	17
2" x 3/4"	15
2" x 1"	15
2" x 1-1/4"	40
2" x 1-1/2"	12
2"	30
2-1/2"	16
3" x 2"	20
3"	12
4"	5
6"	3
8"	2

SOCKET (AW)



UKURAN	ISI / BOX
1/2"	300
3/4"	200
1"	100
1-1/4"	64
1-1/2"	40
2"	25
2-1/2"	40
3"	32
4"	12
6"	4
8"	4
10"	2

VALVE SOCKET (AW)



UKURAN	ISI / BOX
1/2"	450
1/2" x 3/4"	250
3/4"	320
1" x 1/2"	200
1" x 3/4"	175
1"	175
1-1/4"	100
1-1/2"	60
2"	40
3"	48
4"	18

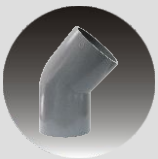
ELBOW (AW)



UKURAN	ISI / BOX
1/2"	225
3/4"	145
1"	80
1-1/4"	40
1-1/2"	25
2"	18
2-1/2"	28
3"	16
4"	9
5"	5
6"	5
8"	2
10"	1

45° ELBOW (AW)

BARU



UKURAN	ISI / BOX
2"	44
4"	18
6"	4

LARGE RADIUS TEE (AW)

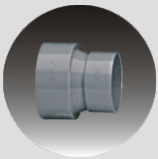
BARU



UKURAN	ISI / BOX
4" x 2"	15
4" x 4"	7
6" x 4"	5

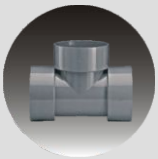
SAMBUNGAN / FITTING RUCIKA STANDARD JIS K-6739 UNTUK APLIKASI AIR KOTOR & BUANGAN

INCREASER (D-IN)



UKURAN	ISI / BOX
1-1/2" x 1-1/4"	90
2" x 1-1/4"	90
2" x 1-1/2"	75
2-1/2" x 1-1/2"	45
2-1/2" x 2"	45
3" x 1-1/2"	32
3" x 2"	32
3" x 2-1/2"	28
4" x 2"	40
4" x 2-1/2"	40
4" x 3"	35
5" x 4"	20
6" x 3"	12
6" x 4"	10
6" x 5"	10
8" x 4"	8
8" x 6"	4

TEE (D-DT)



UKURAN	ISI / BOX
1-1/4"	55
1-1/2"	40
2"	65
2-1/2"	32
3" x 1-1/2"	36
3" x 2"	30
3" x 2-1/2"	22
3"	20
4" x 2"	15
4" x 3"	12
4"	8
5" x 4"	6
5"	10
6" x 4"	8
6"	6
8" x 4"	4
8"	2

CLEAN OUT CAP (D-CO)



UKURAN	ISI / BOX
4"	27

CLEAN OUT (D)



UKURAN	ISI / BOX
2"	90
3"	80
4"	36

P-TRAP (D)



UKURAN	ISI / BOX
2”	12

LARGE RADIUS TEE (D-LT)



UKURAN	ISI / BOX
1-1/2” x 1-1/4”	35
1-1/2” x 1-1/2”	30
2” x 1-1/2”	18
2” x 2”	15
2-1/2” x 1-1/2”	10
2-1/2” x 2”	30
2-1/2” x 2-1/2”	18
3” x 2”	20
3” x 2-1/2”	16
3” x 3”	15
4” x 2”	14
4” x 3”	8
4” x 4”	6
5” x 4”	4
6” x 4”	5
6” x 6”	4

Y-BRANCH (D-Y)



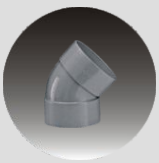
UKURAN	ISI / BOX
1-1/2” x 1-1/4”	40
1-1/2” x 1-1/2”	30
2” x 1-1/4”	24
2” x 2”	18
3” x 2”	20
3” x 3”	15
4” x 2”	15
4” x 3”	8
4” x 4”	6
5” x 4”	9
6” x 4”	5
6” x 6”	6

LARGE RADIUS DOUBLE TEE (D-WLT)



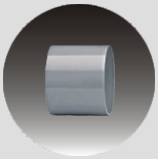
UKURAN	ISI / BOX
2” x 2”	10
3” x 2”	15
4” x 4”	8

45° ELBOW (D-45L)



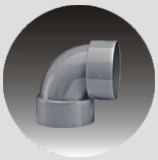
UKURAN	ISI / BOX
1-1/4”	100
1-1/2”	75
2”	100
2-1/2”	60
3”	35
4”	15
5”	15
6”	10
8”	4
10”	2
12”	1

SOCKET (D-DS)



UKURAN	ISI / BOX
1-1/4”	200
1-1/2”	115
2”	72
2-1/2”	100
3”	60
4”	30
5”	30
6”	18
8”	8
10”	8

ELBOW (D-DL)



UKURAN	ISI / BOX
1-1/4”	90
1-1/2”	60
2”	100
2-1/2”	45
3”	30
4”	15
5”	15
6”	10
8”	3
10”	2
12”	1

LARGE RADIUS ELBOW (D-LL)



UKURAN	ISI / BOX
1-1/4”	60
2”	20
3”	18
4”	8
5”	5
6”	6

CAP (D)



UKURAN	ISI / BOX
1-1/4”	144
1-1/2”	84
2”	54
3”	60
4”	30

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www.wavin.co.id

06/2012

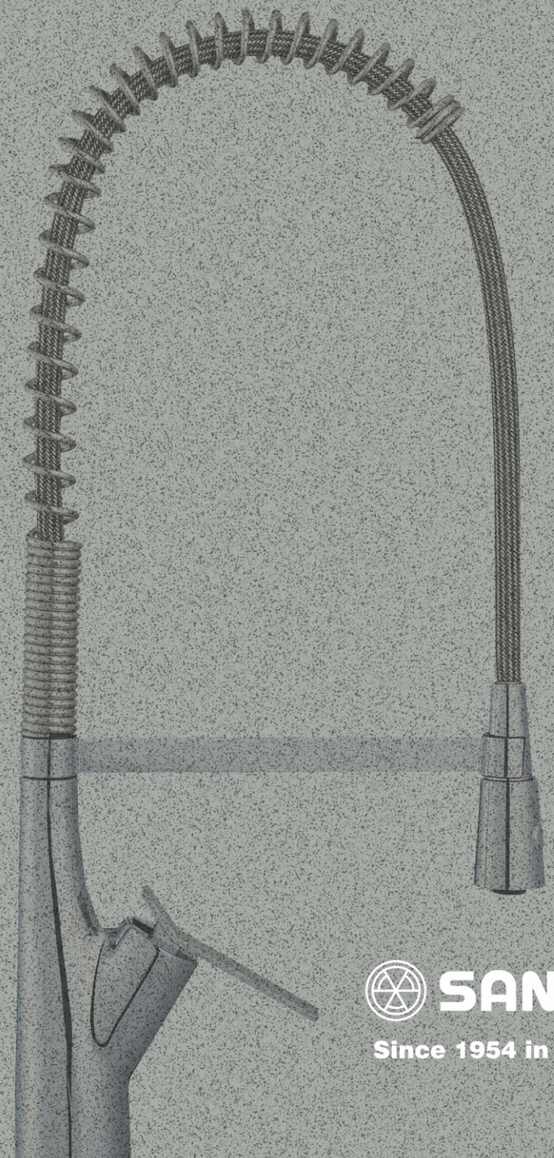
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SAN-EI

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2016 - 2017

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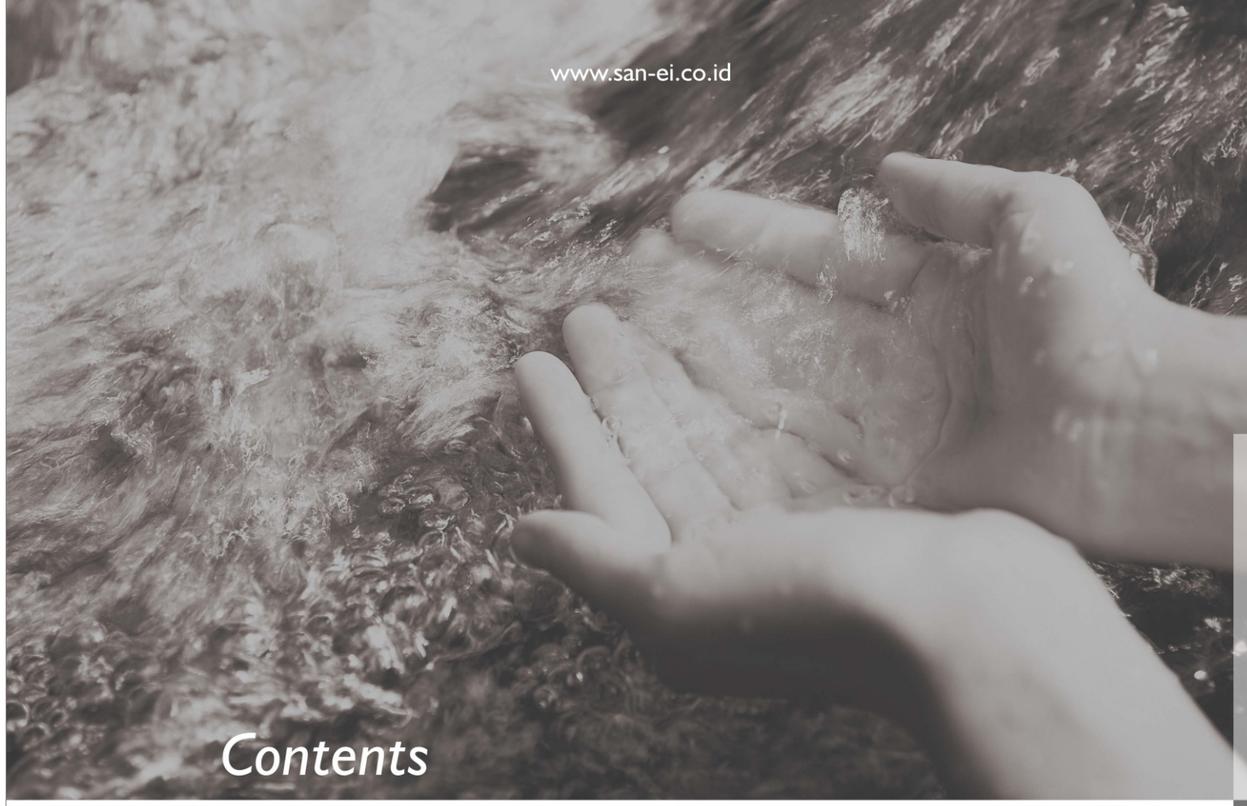
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Images of Life

Water was not just the first stage
to create life on this planet.
It also has given immeasurable impacts
in the course of evolution.
Like lots of Aquatic life,
the human body shows traces
of such process.

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Design

Convenient | Elegant | Flexible



Ideally, a home interior should be like work of art.

It should have the same sort of presence. Artistic lines that suggest elegance and comfort. “Water interface“ products designed by SAN-EI aim to meet the heightened expectations of the twenty-first century. As you can see here, their refined functional beauty is a pleasure to behold.

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SAN-EI

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NEW items







NEW Column Shower Set





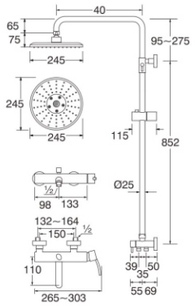
Change shower patterns by pushing the button.

Adjustable column high : 95mm~275mm with stopper

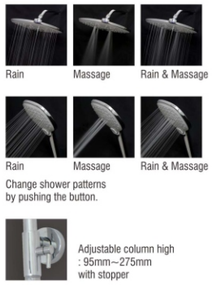
NEW

W7200-S
SINGLE LEVER BATH MIXER with COLUMN SHOWER SET

- Column set with change lever to wall shower or hand shower.
- Changeable wall shower pattern.
- Changeable hand shower pattern.
- Single lever bath mixer with change lever to column set or to bath spout.
- Adjustable column high: 95mm~275mm with stopper.







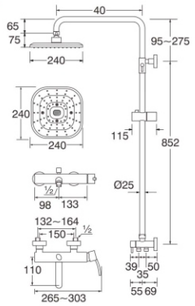
Change shower patterns by pushing the button.

Adjustable column high : 95mm~275mm with stopper

NEW

W7250-S
SINGLE LEVER BATH MIXER with COLUMN SHOWER SET

- Column set with change lever to wall shower or hand shower.
- Changeable wall shower pattern.
- Changeable hand shower pattern.
- Single lever bath mixer with change lever to column set or to bath spout.
- Adjustable column high: 95mm~275mm with stopper.







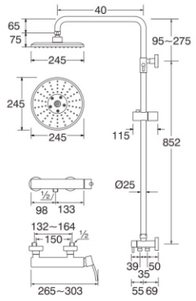
Change shower patterns by pushing the button.

Adjustable column high : 95mm~275mm with stopper

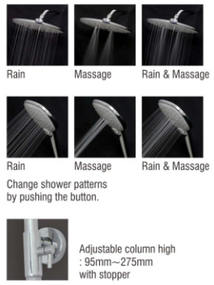
NEW

W7700-S
SINGLE LEVER BATH MIXER with COLUMN SHOWER SET

- Column set with change lever to wall shower or hand shower.
- Changeable wall shower pattern.
- Changeable hand shower pattern.
- Single lever bath mixer.
- Adjustable column high: 95mm~275mm with stopper.







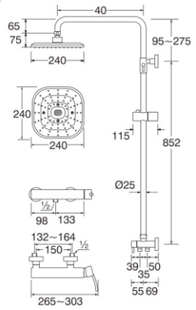
Change shower patterns by pushing the button.

Adjustable column high : 95mm~275mm with stopper

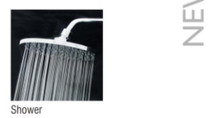
NEW

W7750-S
SINGLE LEVER BATH MIXER with COLUMN SHOWER SET

- Column set with change lever to wall shower or hand shower.
- Changeable wall shower pattern.
- Changeable hand shower pattern.
- Single lever bath mixer.
- Adjustable column high: 95mm~275mm with stopper.







Mode : **"Stop & Drop"** to prevent damage due to high water pressure

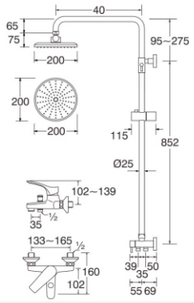


Adjustable column high : 95mm~275mm with stopper

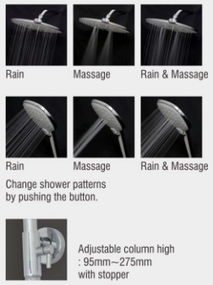
NEW

W7900-S
SINGLE LEVER BATH MIXER with COLUMN SHOWER SET

- Column set with change lever to wall shower or hand shower.
- Changeable hand shower pattern.
- Single lever bath mixer with change lever to column set or to bath spout.
- Adjustable column high: 95mm~275mm with stopper.







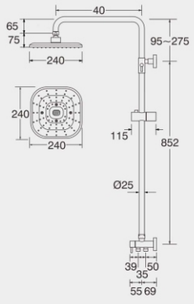
Change shower patterns by pushing the button.

Adjustable column high : 95mm~275mm with stopper

NEW

W7750-X
COLUMN SHOWER SET

- Column set with change lever to wall shower or hand shower.
- Changeable wall shower pattern.
- Changeable hand shower pattern.
- Adjustable column high: 95mm~275mm with stopper.







NEW

PS20
RELAXATION WALL SHOWER

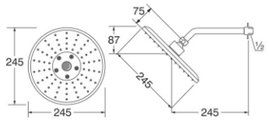
- Adjustable shower head.
- Adjustable shower patterns
- 3 (three) patterns by pushing the button.


Rain


Massage


Rain & Massage





NEW

PS21
RELAXATION WALL SHOWER

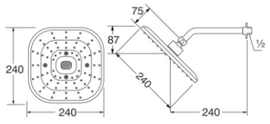
- Adjustable shower head.
- Adjustable shower patterns
- 3 (three) patterns by pushing the button.


Rain


Massage


Rain & Massage

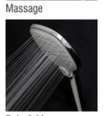







Rain


Massage


Rain & Massage

NEW

PS3620C
RELAXATION SHOWER SET

- Adjustable shower patterns.
- 3 (three) patterns by pushing the button.
- Metal hose length 1.5 m.
- Shower bracket included.





NEW

PS3610C
RELAXATION SHOWER SET

- Adjustable shower patterns.
- 3 (three) patterns by pushing the button.
- Metal hose length 1.5 m.
- Shower bracket included.


Rain


Massage


Rain & Massage







NEW

PS7963C - MW2
WATER-PURIFIER SHOWER SET

- Water-Purifier cartridge (PM7163-1) included.
- Hose length 1.3 mtr.
- Shower bracket included.





NEW

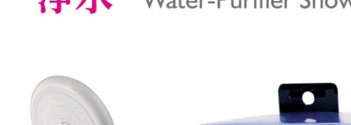
PS7963C - CP6
WATER-PURIFIER SHOWER SET

- Water-Purifier cartridge (PM7163-1) included.
- Hose length 1.3 mtr.
- Shower bracket included.

Water-Purifier Cartridge's Use Periods:
In the case of using **8 minutes per day**, the effect of the cartridge about **2 months**. It varies according to your water conditions, please replace water-purifier cartridge (code type: **PM7163-1**).

Free residual chlorine capacity about: **4,000 L** (Flow Rate: 8 L/min)

How to Replace the Cartridge





NEW

PM7163-1
WATER-PURIFIER CARTRIDGE

- Calcium Sulfite

How does Chlorine cause these serious health problems?

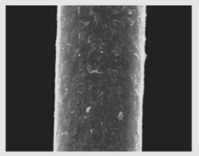
Without getting too technical, 50% of exposure to chlorine happens in the shower. Part is done through the skin absorbing the chemical and the other is by inhaling the vapors released through a hot shower. The heat from a hot shower releases the chlorine vapors and can contaminate the lung. Chlorine will dry out and render hair stiffer. By using a filtered shower head, hair will stay moisturized, prevent tangles and damages.

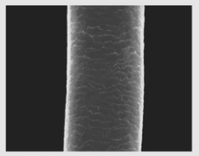
Bagaimana Kaporit/Chlorine menyebabkan masalah kesehatan yang serius?

Tanpa berbicara terlalu teknis, 50% paparan kaporit terjadi pada saat mandi. Air ber-Kaporit/Chlorine dapat menyebabkan kerusakan rambut dan kulit. Uap air panas yang terhirup juga dapat mencemari paru-paru. Kaporit/Chlorine menyebabkan rambut menjadi kering dan kaku. Dengan filter di dalam shower-head, membantu rambut tetap lembut juga mencegah kusut dan rusak.

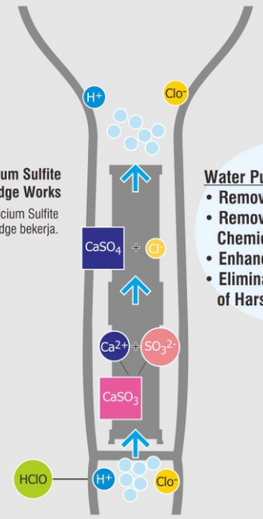
This image bellow shows a cuticle was damaged by chlorine and the other image such as normal cuticle

Gambar dibawah menunjukan kutikula rambut yang rusak oleh Kaporit/Chlorine dan gambar lain kutikula rambut yang normal.


Damaged Cuticle


Normal Cuticle

How Calcium Sulfite inside Cartridge Works
Bagaimana Calcium Sulfite di dalam Cartridge bekerja.



Water Purifier Cartridge:
- **Removes Chlorine.**
- **Removes Synthetic Chemicals.**
- **Enhanced pH Balance.**
- **Eliminates Absorption of Harsh Chemicals.**

NEW Single Lever Bath Mixer

NEW Design

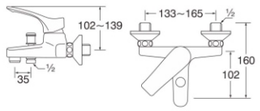
NEW

SK27351
SINGLE LEVER BATH MIXER
with SHOWER SET

- Hose length 1.3m.
- Shower bracket included.







NEW Design

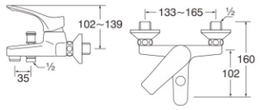
NEW

SK27351-CH
SINGLE LEVER BATH MIXER
with SHOWER SET

- Metal hose length 1.5m.
- Shower bracket included.







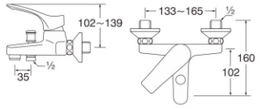
NEW Design

NEW

SK27351-X
SINGLE LEVER BATH MIXER

- Useable for shower bath mixer.





NEW Single Lever Basin Tap

NEW Design

NEW

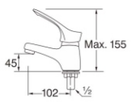
Y503R
PY503R
SINGLE LEVER BASIN TAP

- Cold water only.





PY503R



NEW Design

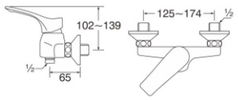
NEW

SK28351
SINGLE LEVER BATH MIXER
with SHOWER SET

- Hose length 1.3m.
- Shower bracket included.







NEW Design

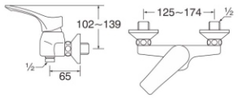
NEW

SK28351-CH
SINGLE LEVER BATH MIXER
with SHOWER SET

- Metal hose length 1.5m.
- Shower bracket included.







NEW Design

NEW

SK28351-X
SINGLE LEVER BATH MIXER

- Useable for shower bath mixer.





NEW Toilet Shower





NEW

PSN75C-CH
TOILET SHOWER SET
(Chrome)

- Metal hose length 1.2m.
- Shower bracket included.



NEW

SN75C-CH
TOILET SHOWER SET
(Chrome)



NEW

PSN75-80X-CH
TOILET SHOWER HEAD
(Chrome)

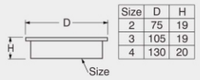


NEW Utility Items



NEW

HN59
SQUARE FLOOR CLEAN-OUT
2, 3, 4”



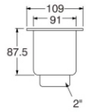
Size	D	H
2	75	19
3	105	19
4	130	20



NEW

HN508-L
SQUARE
FLOOR STRAINER 4 X 2"

- With locking plate.

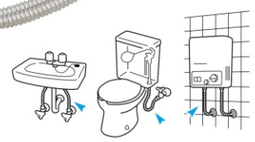




NEW

T10
S/S FLEXIBLE
PIPE ½”
1.500, 2.000, 3.000,
5.000 (mm)

- Maximum pressure 1.72MPa.
- Maximum temperature 90°C.
- Material : stainless steel



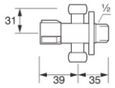


PVN230

NEW

VN230
PVN230
STOP VALVE

- Spindle kerep type.





NEW Tools & Parts



NEW

R391
SAW

- Useable to cut pipe
  (steel, PVC or tin)



NEW

R391-F
BLADE

- Useable to cut pipe
  (steel, PVC or tin)





NEW

P75-1S-10
SEAL TAPE

- 10 pcs per-box.
- Tape Thickness 0.1mm.
- Tape Width 13mm.
- Tape Length 10 Mtrs.
- Made of PTFE.



NEW Ball Tap

NEW

V57
BALL TAP
1, 1¼, 1½, 2"

- Floating ball : **Stainless Steel (SUS316)**.
- Maximum water temperature **120°C.**
- Workable on water pressure
  0.098 ~ 0.74MPa (1 ~ 7.5Kgf/cm²).
- For V57 size 2", use rounded floating ball.
- Size 1¼, 1½, 2" : does not have a mounting nut.





V52
BALL TAP

NEW NEW

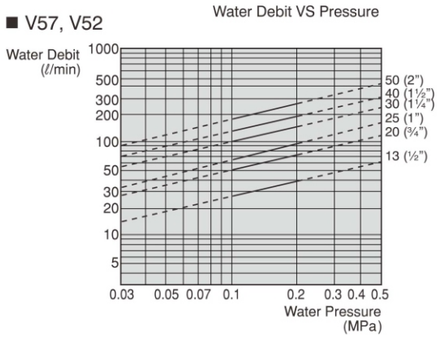
½, ¾, 1, 1¼, 1½, 2"

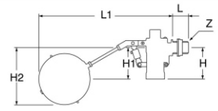
- Floating ball : **HDPE.**
  (High-Density PolyEthylene)
- Maximum water temperature **60°C.**
- Workable on water pressure
  0.098 ~ 0.74MPa (1 ~ 7.5Kgf/cm²).
- Size 1¼, 1½, 2" : does not have a mounting nut.





■ V57, V52





Product Measure V57, V52

	L1		L	H	H1	H2	Z	R.Ball	Pole
	When the water discharge	When sealing			When sealing	When the water discharge			Length X Dia.
13 (½")	205 ~ 251	307 ~ 337	30	48	52 ~ 116	230 ~ 260	PJ1/2	95	160X6
20 (¾")	153 ~ 220	332 ~ 374	35	72	140 ~ 185	330 ~ 335	PJ3/4	115	200X6
25 (1")	172 ~ 240	345 ~ 395	35	78	150 ~ 210	330 ~ 335	PJ1	115	200X6
30 (1¼")	170 ~ 250	359 ~ 413	22	84	110 ~ 190	340 ~ 355	R11/4	115	220X6
40 (1½")	310 ~ 458	460 ~ 575	23	85	55 ~ 253	309 ~ 430	R11/2	135	300X8
50 (2")	305 ~ 454	496 ~ 610	26	98	69 ~ 278	370 ~ 485	R2	150	300X8

L1, H1 during hydrostatic pressure 0.3MPa

NEW Kitchen Mixer



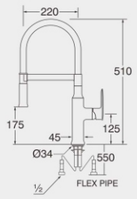
JAPAN Quality

NEW

K8700
SINGLE LEVER
SINK MIXER

- With swinging pipe.
- Changeable shower patterns.





NEW Shower Elbow

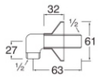




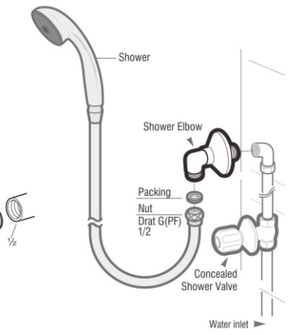
NEW

PT205
SHOWER ELBOW

- Useable to attach shower hose.







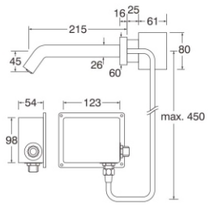
NEW Sensor Faucet



NEW

EA100
SENSOR SINK TAP

- Power supply : DC 6V.
- Workable on water pressure 0.05 ~ 0.6MPa.
- Water temperatures 1 ~ 55°C.

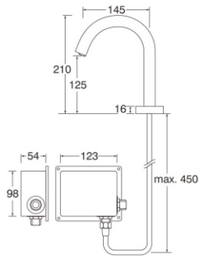




NEW

EY500
SENSOR BASIN TAP

- Power supply : DC 6V.
- Workable on water pressure 0.05 ~ 0.6MPa.
- Water temperatures 1 ~ 55°C.



SAN-EI

Hōmatsu 泡沫 series



Hō matsu [泡沫] (Japan)
Means: "Effervecent (bubbles in a liquid; fizz)."

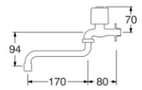
NEW



NEW

A10JC-HM
PA10JC-HM
SWINGING SINK TAP

- Spindle kerep type.
- Effervescent water flow with water filter.





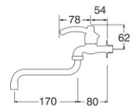
PA10JC-HM



NEW

A10JSX-HM
PA10JSX-HM
SWINGING SINK TAP

- Ceramic cartridge type.
- Effervescent water flow with water filter.





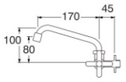
PA10JSX-HM



NEW

A27JP-HM
PA27JP-HM
SWINGING SINK TAP

- Spindle kerep type.
- Effervescent water flow with water filter.





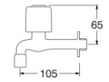
PA27JP-HM



NEW

Y20C-HM
PY20C-HM
SINK TAP

- Spindle kerep type.
- Effervescent water flow with water filter.





PY20C-HM



NEW

A26JSX-HM
PA26JSX-HM
SWINGING SINK TAP

- Ceramic cartridge type.
- Effervescent water flow with water filter.



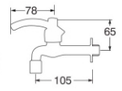
PA26JSX-HM



NEW

Y20SX-HM
PY20SX-HM
SINK TAP

- Ceramic cartridge type.
- Effervescent water flow with water filter.





PY20SX-HM



NEW

A29JSX-HM
PA29JSX-HM
SWINGING SINK TAP

- Ceramic cartridge type.
- Effervescent water flow with water filter.



PA29JSX-HM



NEW

A59JSX-HM
PA59JSX-HM
SWINGING SINK TAP

- Ceramic cartridge type.
- Effervescent water flow with water filter.



PA59JSX-HM

Kolumn SERIES

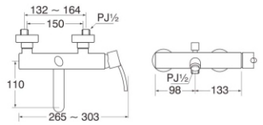






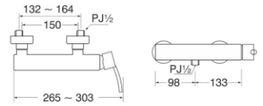
SK18310-X
SINGLE LEVER BATH MIXER

- With Change Lever to Wall Shower & to Bath Spout.





SK19310-X
SINGLE LEVER BATH MIXER



Shower Set







PS310C
SHOWER SET

- Metal hose length 1.5m.
- Shower bracket included.



S310C
SHOWER SET

- Metal hose length 1.5m.
- Shower bracket included.

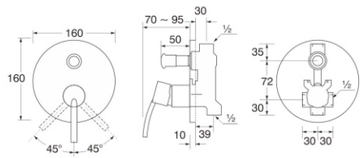


PS310-80X
SHOWER HEAD



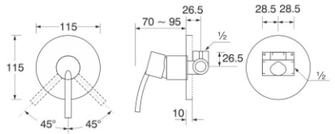
V101
CONCEALED SINGLE LEVER BATH MIXER

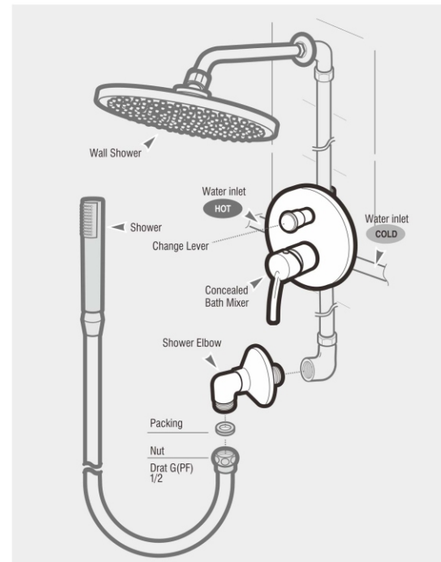
- With Change Lever to Wall Shower & to Bath Spout /Shower Elbow.





V100
CONCEALED SINGLE LEVER BATH MIXER





NEW



PT205
SHOWER ELBOW

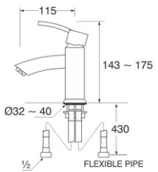
- Useable to attach shower hose.



Basin Mixer



KN380
SINGLE LEVER BASIN MIXER





Mixer Faucets

Bathroom

NEW Design



NEW Design

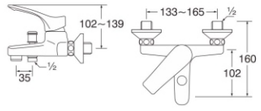
NEW

SK27351
SINGLE LEVER BATH MIXER
with SHOWER SET

- Hose length 1.3m.
- Shower bracket included.







NEW Design

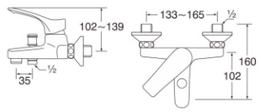
NEW

SK27351-CH
SINGLE LEVER BATH MIXER
with SHOWER SET

- Metal hose length 1.5m.
- Shower bracket included.





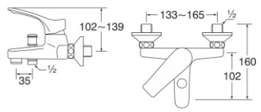


NEW Design

NEW

SK27351-X
SINGLE LEVER BATH MIXER

- Useable for shower bath mixer.



• Shower set type:
PSN351C-White

NEW Design

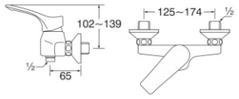
NEW

SK28351
SINGLE LEVER BATH MIXER
with SHOWER SET

- Hose length 1.3m.
- Shower bracket included.







NEW Design

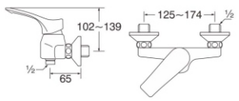
NEW

SK28351-CH
SINGLE LEVER BATH MIXER
with SHOWER SET

- Metal hose length 1.5m.
- Shower bracket included.







NEW Design

NEW

SK28351-X
SINGLE LEVER BATH MIXER

- Useable for shower bath mixer.







SK30C
BATH MIXER
with SHOWER SET





- Hose length 1.3m.
- Shower head with On/Off button.
- Shower bracket included.
- Spindle kerep type.



SKN30C
BATH MIXER
with SHOWER SET





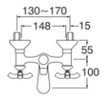
- Hose length 1.3m.
- ECO-Shower head with On/Off button.
- Shower bracket included.
- Spindle kerep type.



SK30P
BATH MIXER
with SHOWER SET



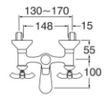
- Hose length 1.3m.
- Shower head with On/Off button.
- Shower bracket included.
- Spindle kerep type.



SKN30P
BATH MIXER
with SHOWER SET



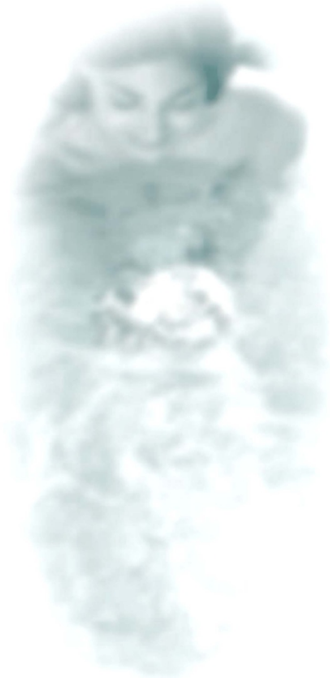
- Hose length 1.3m.
- ECO-Shower head with On/Off button.
- Shower bracket included.
- Spindle kerep type.



Note

PINEAPPLE Series
Metal Handle Type | Chrome Finished

- Shower set type:
PSN353C-White

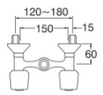






SK35C
BATH MIXER
with SHOWER SET

- Hose length 1.3m.
- Shower head with On/Off button.
- Shower bracket included.
- Spindle kerep type.





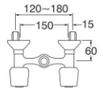
- Shower set type:
  PSN353C - White





SKN35C
BATH MIXER
with SHOWER SET

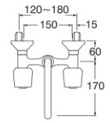
- Hose length 1.3m.
- ECO-Shower head with On/Off button.
- Shower bracket included.
- Spindle kerep type.





K35C
SINK MIXER

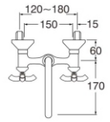
- Spindle kerep type.





K35P
SINK MIXER

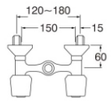
- Spindle kerep type.





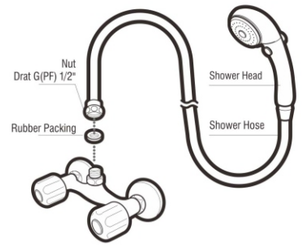
K35C-X
SINK MIXER

- Spindle kerep type.
- Useable for shower bath mixer.





- Useable for shower bath mixer.



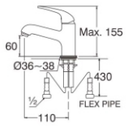
Note

PINEAPPLE Series
Metal Handle Type | Chrome Finished

Basin — Single Lever Basin Mixer



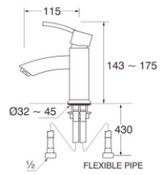
KN330
SINGLE LEVER
BASIN MIXER



Kolumn SERIES

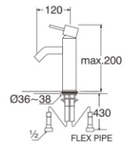


KN380
SINGLE LEVER
BASIN MIXER



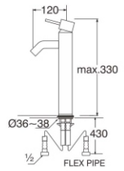


KN350-S
SINGLE LEVER
BASIN MIXER





KN350-L
SINGLE LEVER
BASIN MIXER



JAPAN Quality

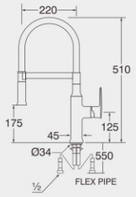
NEW



K8700
SINGLE LEVER
SINK MIXER

- With swinging pipe.
- Changeable shower patterns.



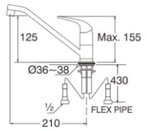


Single Lever Sink Mixer — Kitchen



KN870
SINGLE LEVER
SINK MIXER

- With swinging pipe.



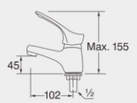
NEW Design



NEW

Y503R
PY503R
SINGLE LEVER
BASIN TAP

- Cold water only





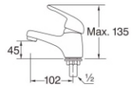
PY503R

Single Lever Basin Tap
(Cold Water Only)



Y500R
PY500R
SINGLE LEVER
BASIN TAP

- Cold water only



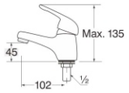


PY500R



Y501R
PY501R
SINGLE LEVER
BASIN TAP

- Cold water only



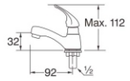


PY501R



Y510R
PY510R
SINGLE LEVER
BASIN TAP

- Cold water only



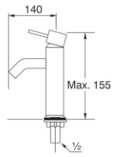


PY510R



Y350-S
SINGLE LEVER
BASIN TAP

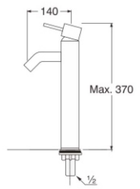
- Cold water only.





Y350-L
SINGLE LEVER
BASIN TAP

- Cold water only.

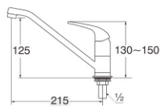


Single Lever Sink Tap — Kitchen
(Cold Water Only)



A870
SINGLE LEVER
SINK TAP

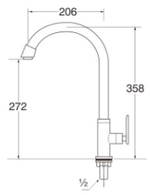
- With swinging pipe.
- Cold water only.





A500
SWINGING SINK TAP

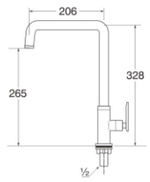
- With swinging pipe.
- Cold water only.
- Ceramic cartridge type.





A510
SWINGING SINK TAP

- With swinging pipe.
- Cold water only.
- Ceramic cartridge type.

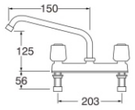


Kitchen — Two-Valves Mixer Faucet



K611
DECK TYPE SINK MIXER

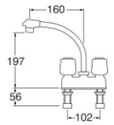
- Two holes installation.
- Spindle kerep type.





K71D
DECK TYPE SINK MIXER

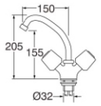
- Two holes installation.
- Spindle kerep type.





K811K
ONE-HOLE SINK MIXER

- One hole installation.
- Spindle kerep type.

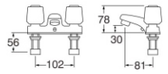


Basin



K51
BASIN MIXER

- Two holes installation.
- Spindle kerep type.



Parts & Tools

NEW

R391
SAW

- Useable to cut pipe (steel, PVC or tin)



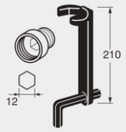
NEW

R391-F
BLADE

- Useable to cut pipe (steel, PVC or tin)



PR351
BASIN TAP SPANNER







PH392
BASIN STRAINER









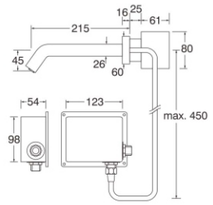
Sensor Faucet



NEW

EA100
SENSOR SINK TAP

- Power supply : DC 6V.
- Workable on water pressure 0.05 ~ 0.6MPa.
- Water temperatures 1 ~ 55°C.

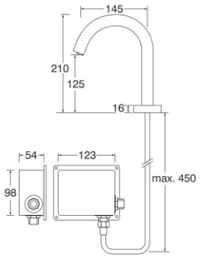




NEW

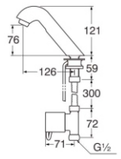
EY500
SENSOR BASIN TAP

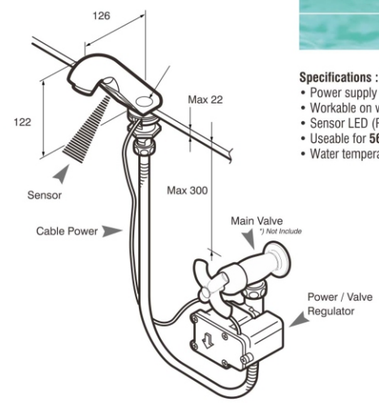
- Power supply : DC 6V.
- Workable on water pressure 0.05 ~ 0.6MPa.
- Water temperatures 1 ~ 55°C.





EY501
SENSOR BASIN TAP





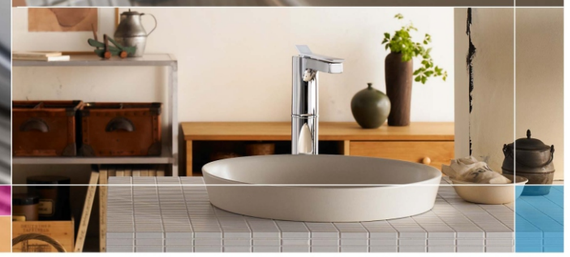


Specifications : EY501
- Power supply : **DC 6V**.
- Workable on water pressure **0.05 ~ 0.74MPa**.
- Sensor LED (Red), range distance **50 ~ 120mm**.
- Useable for **56,000 cycles** (**100 times/day for 2 years**).
- Water temperatures **0 ~ 60°C**.

SUTTO







Bathroom



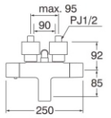




NEW

SK1831
THERMOSTATIC BATH MIXER
with SHOWER SET

- Thermostatic function.



SAN-EI

Kitchen

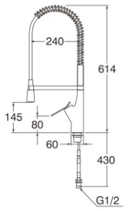


NEW

K8731JV
SINGLE LEVER
SINK MIXER

- Swinging pipe, rotation 130°.
- Flexible pipe with
  snap on connector.





Designs Series



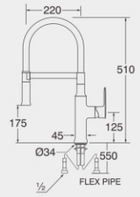
JAPAN Quality

NEW

K8700
SINGLE LEVER
SINK MIXER

- With swinging pipe.
- Changeable shower patterns.





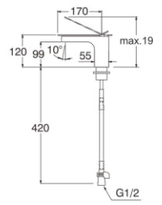
Basin



NEW

K4731NJV
SINGLE LEVER BASIN MIXER

- Flexible pipe with snap on connector.

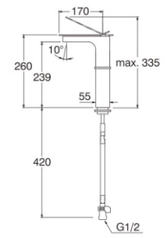




NEW

K4731NJV-2T
SINGLE LEVER BASIN MIXER

- Flexible pipe with snap on connector.



SAN-EI



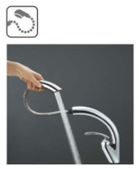


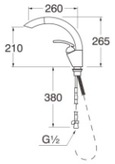
Kitchen



K8790JV
SINGLE LEVER SINK MIXER

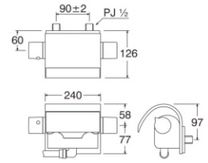
- Swinging pipe, rotation 110°.
- Flexible pipe with snap on connector.
- Pull-out shower head with metal hose (1.2m).





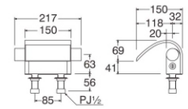
SK2890
BATH MIXER
with SHOWER SET







K7590
ROMAN TUB BATH MIXER



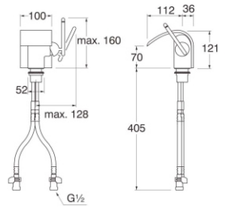
Basin

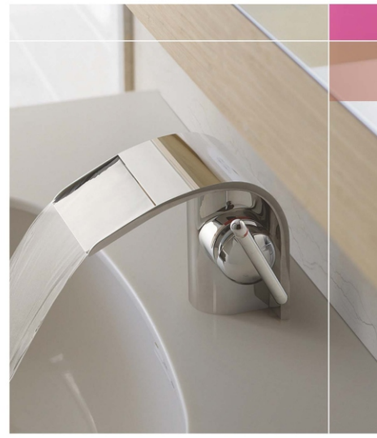


K4790NJV
SINGLE LEVER BASIN MIXER

- Flexible pipe with snap on connector.









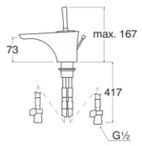
Basin

K4780PJV
SINGLE LEVER BASIN MIXER

- Joystick lever handle.
- Flexible pipe with snap on connector.
- Includes pop-up in use.





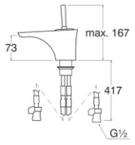


K4780NJV
SINGLE LEVER BASIN MIXER

- Joystick lever handle.
- Flexible pipe with snap on connector.













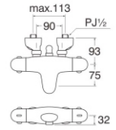
Bathroom

SK1870
THERMOSTATIC BATH MIXER
with SHOWER SET

- Thermostatic function.
- Changeable shower patterns.







Faucets & Valves

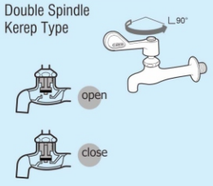
Faucets Mechanism

Kerep Type

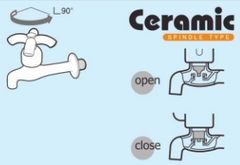
Spindle Kerep Type



Double Spindle Kerep Type



Ceramic Cartridge Type



Note

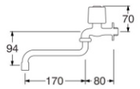
- Samurai series — Metal Handle Type | Chrome Finished
- PINEAPPLE Series — Metal Handle Type | Chrome Finished
- miniCERA SERIES — Metal Handle Type | Chrome Finished
- Hōmatsu 泡沫 series — Effervescence Water Flow | Water Filter
- Ceramic SPINDLE TYPE — Cartridge Head-Part One-Touch Spin Handle (90 Degrees) L-90°
- P — Plastic Packaging — Type-Code | 1 set/pack

Swinging Sink Tap



A10JC-HM
PA10JC-HM
SWINGING SINK TAP

- Spindle kerep type.
- Effervescent water flow with water filter.



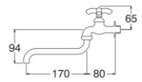


PA10JC-HM



A10JP
PA10JP
SWINGING SINK TAP

- Spindle kerep type.



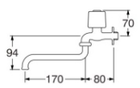


PA10JP



A10JC
PA10JC
SWINGING SINK TAP

- Spindle kerep type.



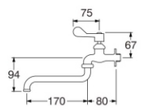


PA10JC



A10JRN
SWINGING SINK TAP

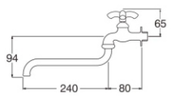
- Double spindle kerep type.





A10JP-L2
SWINGING SINK TAP

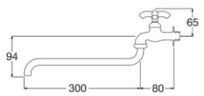
- Spindle kerep type.
- Pipe length : 240mm.





A10JP-L3
SWINGING SINK TAP

- Spindle kerep type.
- Pipe length : 300mm.

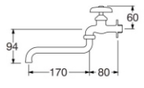


SAN-EI



A10J
PA10J
SWINGING SINK TAP

- Spindle kerep type.



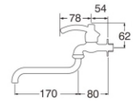


PA10J



A10JSX
PA10JSX
SWINGING SINK TAP

- Ceramic cartridge type.



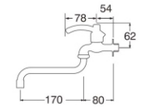


PA10JSX



A10JSX-HM
PA10JSX-HM
SWINGING SINK TAP

- Ceramic cartridge type.
- Effervescent water flow with water filter.



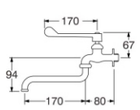


PA10JSX-HM



A10JRN-L
SWINGING SINK TAP

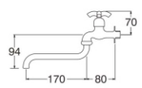
- Double spindle kerep type.





A10JPR
PA10JPR
SWINGING SINK TAP

- Ceramic cartridge type.



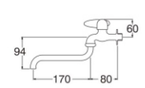


PA10JPR



A10JMR
PA10JMR
SWINGING SINK TAP

- Ceramic cartridge type.





PA10JMR

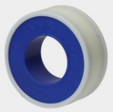
Parts & Tools



NEW

P75-1S-10
SEAL TAPE

- 10 pcs per-box.
- Tape Thickness 0.1mm.
- Tape Width 13mm.
- Tape Length 10 Mtrs.
- Made of PTFE.









PP75-1S-10
SEAL TAPE

- Tape Thickness 0.1mm.
- Tape Width 13mm.
- Tape Length 10 Mtrs.
- Made of PTFE.

PR36
SINK TAP SPANNER

NEW

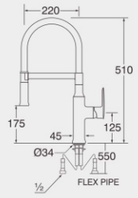
K8700
SINGLE LEVER
SINK MIXER

- With swinging pipe.
- Changeable shower patterns.





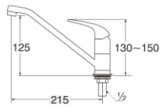
JAPAN Quality





A870
SINGLE LEVER
SINK TAP

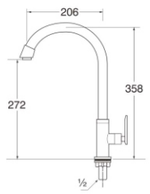
- With swinging pipe.
- Cold water only.





A500
SWINGING SINK TAP

- With swinging pipe.
- Cold water only.
- Ceramic cartridge type.





A510
SWINGING SINK TAP

- With swinging pipe.
- Cold water only.
- Ceramic cartridge type.

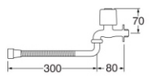
Flexible Sink Tap



A18JC
FLEXIBLE SINK TAP

- Spindle kerep type.

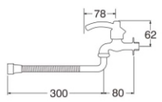






A18JSX
PA18JSX
FLEXIBLE SINK TAP

- Ceramic cartridge type.





PA18JSX

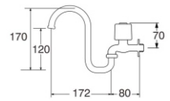
Note

S Series	Samurai series	PY Series	PINEAPPLE Series	C	Ceramic SPINDLE TYPE
Metal Handle Type | Chrome Finished		Metal Handle Type | Chrome Finished		Cartridge Head-Part One-Touch Spin Handle (90 Degrees)	P Plastic Packaging
					Type-Code | 1 set/pack



A16JC
SWINGING SINK TAP

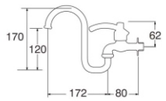
- Spindle kerep type.





A16JSX
SWINGING SINK TAP

- Ceramic cartridge type.

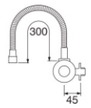




A286JC
PA286JC
FLEXIBLE SINK TAP

- Spindle kerep type.





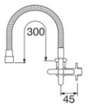


PA286JC



A286JP
PA286JP
FLEXIBLE SINK TAP

- Spindle kerep type.





PA286JP



A586JC
PA586JC
FLEXIBLE SINK TAP

- Spindle kerep type.







PA586JC



A586JP
PA586JP
FLEXIBLE SINK TAP

- Spindle kerep type.





PA586JP



NEW

A26JSX-HM
PA26JSX-HM
SWINGING SINK TAP

- Ceramic cartridge type.
- Effervescent water flow with water filter.



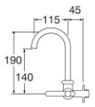


PA26JSX-HM

A26JSX
PA26JSX
SWINGING SINK TAP

- Ceramic cartridge type.





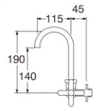


PA26JSX

A26JP
PA26JP
SWINGING SINK TAP

- Spindle kerep type.





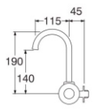


PA26JP

A26JC
SWINGING SINK TAP

- Spindle kerep type.

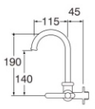




A26JRN
SWINGING SINK TAP

- Double spindle kerep type.

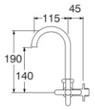




A26JPR
PA26JPR
SWINGING SINK TAP

- Ceramic cartridge type.





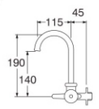


PA26JPR

A26JMR
PA26JMR
SWINGING SINK TAP

- Ceramic cartridge type.





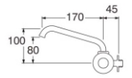


PA26JMR



A27JC
PA27JC
SWINGING SINK TAP

- Spindle kerep type.





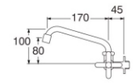
PA27JC

NEW

A27JP-HM
PA27JP-HM
SWINGING SINK TAP

- Spindle kerep type.
- Effervescent water flow with water filter.





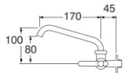


PA27JP-HM

A27JRN
SWINGING SINK TAP

- Double spindle kerep type.

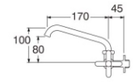




A27JP
PA27JP
SWINGING SINK TAP

- Spindle kerep type.





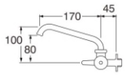


PA27JP



A27JMR
SWINGING SINK TAP

- Ceramic cartridge type.



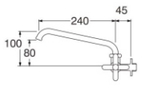
Note

- Samurai series — Metal Handle Type | Chrome Finished
- Pineapple Series — Metal Handle Type | Chrome Finished
- miniCERA Series — Metal Handle Type | Chrome Finished
- Hōmatsu 泡沫 series — Effervescence Water Flow | Water Filter
- Ceramic Series — Cartridge Head-Part, One-Touch Spin Handle (90 Degrees)
- Plastic Packaging — Type-Code | 1 set/pack



A27JP-L2
PA27JP-L2
SWINGING SINK TAP

- Spindle kerep type.
- Pipe length : 240mm.



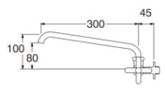


PA27JP-L2



A27JP-L3
SWINGING SINK TAP

- Spindle kerep type.
- Pipe length : 300mm.





Note

Samurai series
Metal Handle Type | Chrome Finished

PINEAPPLE Series
Metal Handle Type | Chrome Finished

miniCERA SERIES
Metal Handle Type | Chrome Finished

Hōmatsu 泡沫 series
Effervescence Water Flow | Water Filter

Ceramic SPINDLE TYPE
Cartridge Head-Part
One-Touch Spin Handle
(90 Degrees)

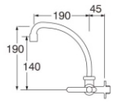
P Plastic Packaging
Type-Code | 1 set/pack



NEW

A29JSX-HM
PA29JSX-HM
SWINGING SINK TAP

- Ceramic cartridge type.
- Effervescent water flow with water filter.



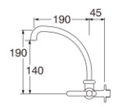


PA29JSX-HM



A29JSX
PA29JSX
SWINGING SINK TAP

- Ceramic cartridge type.



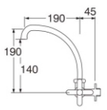


PA29JSX



A29JP
SWINGING SINK TAP

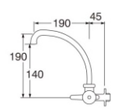
- Spindle kerep type.





A29JMR
PA29JMR
SWINGING SINK TAP

- Ceramic cartridge type.





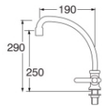
PA29JMR



NEW

A59JSX-HM
PA59JSX-HM
SWINGING SINK TAP

- Ceramic cartridge type.
- Effervescent water flow with water filter.



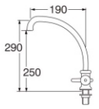


PA59JSX-HM



A59JMR
PA59JMR
SWINGING SINK TAP

- Ceramic cartridge type.



NEW

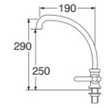


PA59JMR



A59JSX
PA59JSX
SWINGING SINK TAP

- Ceramic cartridge type.



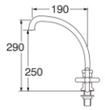


PA59JSX



A59JP
SWINGING SINK TAP

- Spindle kerep type.



Water Filter

NEW

PM7230-B
CLEAN WATER







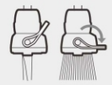




NEW

PM7240
WATER FILTER

- Three layers water filter with Carbon, Charcoal & Calcium.
- Water temperature max. 50°C.
- Changeable shower patterns.

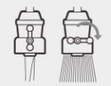






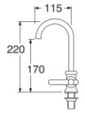
PM7251
WATER FILTER

- Three layers water filter with Carbon, Charcoal & Calcium.
- Water temperature max. 45°C.
- Changeable shower patterns.



A56JSX
PA56JSX
SWINGING SINK TAP

- Ceramic cartridge type.





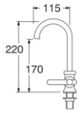


PA56JSX

A56JRN
SWINGING SINK TAP

- Double spindle kerep type.





Note

Samurai Series
Metal Handle Type | Chrome Finished

Pineapple Series
Metal Handle Type | Chrome Finished

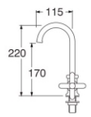
Ceramic Spindle Type
Cartridge Head-Part
One-Touch Spin Handle
(90 Degrees)

P Plastic Packaging
Type-Code | 1 set/pack

A56JP
PA56JP
SWINGING SINK TAP

- Spindle kerep type.







PA56JP

Parts & Tools



NEW

P75-1S-10
SEAL TAPE

- 10 pcs per-box.
- Tape Thickness 0.1mm.
- Tape Width 13mm.
- Tape Length 10 Mtrs.
- Made of PTFE.







PP75-1S-10
SEAL TAPE

- Tape Thickness 0.1mm.
- Tape Width 13mm.
- Tape Length 10 Mtrs.
- Made of PTFE.



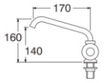
PR36
SINK TAP SPANNER





A57JC
SWINGING SINK TAP

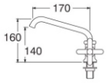
- Spindle kerep type.





A57JP
PA57JP
SWINGING SINK TAP

- Spindle kerep type.





NEW

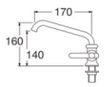


PA57JP

A57JRN
SWINGING SINK TAP

- Double spindle kerep type.





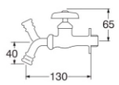


Y12J
PY12J
ALL ROUND SINK TAP

- Spindle kerep type.



PY12J





Water Filter

NEW

PM7230-B
CLEAN WATER







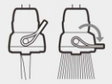


NEW



PM7240
WATER FILTER

- Three layers water filter with Carbon, Charcoal & Calcium.
- Water temperature max. 50°C.
- Changeable shower patterns.

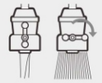






PM7251
WATER FILTER

- Three layers water filter with Carbon, Charcoal & Calcium.
- Water temperature max. 45°C.
- Changeable shower patterns.





NEW

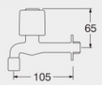
Y20C-HM
PY20C-HM
SINK TAP



PY20C-HM

- Spindle kerep type.
- Effervescent water flow with water filter.







Y20C
PY20C
SINK TAP



PY20C

- Spindle kerep type.

Available :

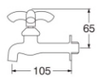
•Blue •White





Y20P
SINK TAP

- Spindle kerep type.





NEW

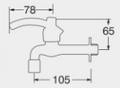
Y20SX-HM
PY20SX-HM
SINK TAP



PY20SX-HM

- Ceramic cartridge type.
- Effervescent water flow with water filter.





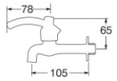


Y20SX
PY20SX
SINK TAP

- Ceramic cartridge type.



PY20SX



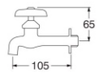


Y20
PY20
SINK TAP

- Spindle kerep type.



PY20





Y20PR
PY20PR
SINK TAP



PY20PR

- Ceramic cartridge type.



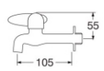


Y20MR
PY20MR
SINK TAP



PY20MR

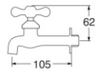
- Ceramic cartridge type.





Y20X
SINK TAP

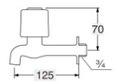
- Spindle kerep type.





Y20C - 3/4"
SINK TAP

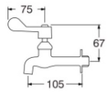
- Spindle kerep type





Y20RN
SINK TAP

- Double spindle kerep type.



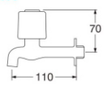


Y20JC
PY20JC
SINK TAP

- Spindle kerep type.



PY20JC



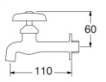


Y20J
PY20J
SINK TAP

- Spindle kerep type.



PY20J



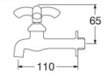


Y20JP
PY20JP
SINK TAP

- Spindle kerep type.



PY20JP



Y20JX
PY20JX
SINK TAP

- Spindle kerep type.

PY20JX

Y20JRN
PY20JRN
SINK TAP

- Double spindle kerep type.

PY20JRN

Y20JRN-L
SINK TAP

- Double spindle kerep type.

Note

- Samurai series — Metal Handle Type | Chrome Finished
- PINEAPPLE Series — Metal Handle Type | Chrome Finished
- miniCERA series — Metal Handle Type | Chrome Finished
- Hōmatsu 泡沫 series — Effervescence Water Flow | Water Filter
- Ceramic Spindle Type — Cartridge Head-Part One-Touch Spin Handle (90 Degrees)
- Plastic Packaging — Type-Code | 1 set/pack

NEW

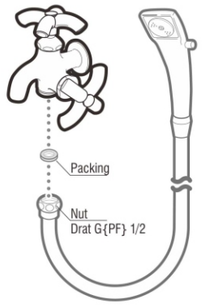
P75-1S-10
SEAL TAPE

- 10 pcs per-box.
- Tape Thickness 0.1mm.
- Tape Width 13mm.
- Tape Length 10 Mtrs.
- Made of PTFE.

PP75-1S-10
SEAL TAPE

- Tape Thickness 0.1mm.
- Tape Width 13mm.
- Tape Length 10Mtrs.
- Made of PTFE.

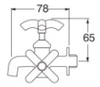
Faucets & Valves





F10P
PF10P
TWO-WAY SINK TAP

PF Series
- Spindle kerep type.
- Useable for shower tap.





PF10P



F10C
PF10C
TWO-WAY SINK TAP

- Spindle kerep type.
- Useable for shower tap.



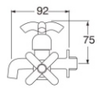


PF10C



F10PR
PF10PR
TWO-WAY SINK TAP

C PF Series
- Ceramic cartridge type.
- Useable for shower tap.



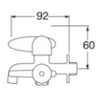


PF10PR



F10MR
PF10MR
TWO-WAY SINK TAP

C mR Series
- Ceramic cartridge type.
- Useable for shower tap.





PF10MR

Parts





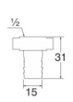
PR32
KEY TAP

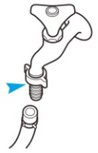






PT30A
HOSE NIPPLE





Note

Samurai series
Metal Handle Type | Chrome Finished

PINEAPPLE Series
Metal Handle Type | Chrome Finished

miniCERA SERIES
Metal Handle Type | Chrome Finished

Ceramic SPINDLE TYPE
Cartridge Head-Part
One-Touch Spin Handle
(90 Degrees)

Plastic Packaging
Type-Code | 1 set/pack



Y30J
PY30J
SINK TAP
with COUPLING

- Spindle kerep type.





PY30J



Y30JP
PY30JP
SINK TAP
with COUPLING

PF Series
- Spindle kerep type.





PY30JP



Y30JC
SINK TAP
with COUPLING

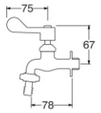
- Spindle kerep type.





Y30JRN
SINK TAP
with COUPLING

- Double spindle kerep type.





Y30JMR
PY30JMR
SINK TAP
with COUPLING

C mR Series
- Ceramic cartridge type.



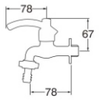


PY30JMR



Y30JSX
PY30JSX
SINK TAP
with COUPLING

C S Series
- Ceramic cartridge type.





PY30JSX



Y70J
PY70J
SINK TAP
with COUPLING

- Spindle kerep type.





PY70J



Y30JPR
PY30JPR
SINK TAP
with COUPLING

C PF Series
- Ceramic cartridge type.

PY30JPR

Single Lever Basin Tap
(Cold Water Only)

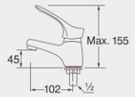
NEW Design



NEW

Y503R
PY503R
SINGLE LEVER
BASIN TAP

- Cold water only.



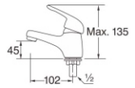


PY503R



Y500R
PY500R
SINGLE LEVER
BASIN TAP

- Cold water only.



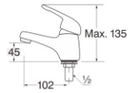


PY500R



Y501R
PY501R
SINGLE LEVER
BASIN TAP

- Cold water only.



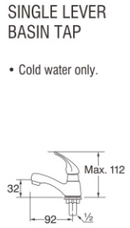


PY501R



Y510R
PY510R
SINGLE LEVER
BASIN TAP

- Cold water only.



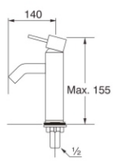


PY510R



Y350-S
SINGLE LEVER
BASIN TAP

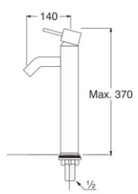
- Cold water only.





Y350-L
SINGLE LEVER
BASIN TAP

- Cold water only.





NEW

P75-1S-10
SEAL TAPE

- 10 pcs per-box.
- Tape Thickness 0.1 mm.
- Tape Width 13 mm.
- Tape Length 10 Mtrs.
- Made of PTFE.



PP75-1S-10
SEAL TAPE

- Tape Thickness 0.1 mm.
- Tape Width 13 mm.
- Tape Length 10 Mtrs.
- Made of PTFE.



PH392
BASIN STRAINER









Note

- Samurai Series — Metal Handle Type | Chrome Finished
- PINEAPPLE Series — Metal Handle Type | Chrome Finished
- miniCERA Series — Metal Handle Type | Chrome Finished
- Ceramic (Spindle Type) — Cartridge Head-Part, One-Touch Spin Handle (90 Degrees)
- **Plastic Packaging** — Type-Code | 1 set/pack

Basin Tap

Y51P
PY51P
BASIN TAP

- Spindle kerep type.



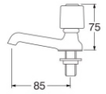


PY51P

Y51C
BASIN TAP

- Spindle kerep type.





Y50JC
PY50JC
BASIN TAP

- Spindle kerep type.





PY50JC

Y50JP
BASIN TAP

- Spindle kerep type.

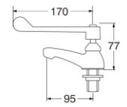




Y50JRN-L
BASIN TAP

- Double spindle kerep type.





Y50JPR
PY50JPR
BASIN TAP

- Ceramic cartridge type.





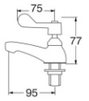


PY50JPR

Y50JRN
BASIN TAP

- Double spindle kerep type.





Y50JSX
PY50JSX
BASIN TAP

- Ceramic cartridge type.

PY50JSX

Y50JMR
PY50JMR
BASIN TAP

- Ceramic cartridge type.

PY50JMR



V24J
PV24J
SHOWER VALVE

- Spindle kerep type.





PV24J



V24JP
PV24JP
SHOWER VALVE

PY Series

- Spindle kerep type.





PV24JP



V24JC
PV24JC
SHOWER VALVE

- Spindle kerep type.





PV24JC



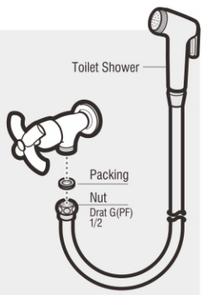
V24JX
PV24JX
SHOWER VALVE

- Spindle kerep type.





PV24JX





V24JPR
PV24JPR
SHOWER VALVE

CR Series PY Series

- Ceramic cartridge type.





PV24JPR



V24JMR
PV24JMR
SHOWER VALVE

CR Series MR Series

- Ceramic cartridge type.





PV24JMR

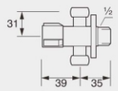
Stop Valve

NEW



VN230
PVN230
STOP VALVE

- Spindle kerep type.





PVN230

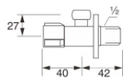




VN220
PVN220
STOP VALVE

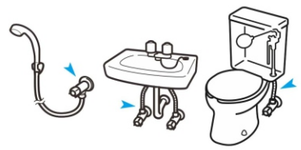
CR Series

- Ceramic cartridge type.





PVN220



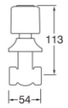


V10JC-B
PV10JC-B
SHOWER VALVE
With BLUE CAP

- Spindle kerep type.
- Concealed installation.
- Color cap : BLUE.



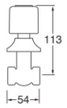
PV10JC-B





V10JC-R
SHOWER VALVE
With RED CAP

- Spindle kerep type.
- Concealed installation.
- Color cap : RED.





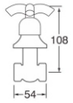
V10JP
PV10JP
SHOWER VALVE

PY Series

- Spindle kerep type.
- Concealed installation.



PV10JP



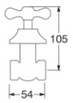


V10JX
PV10JX
SHOWER VALVE

- Spindle kerep type.
- Concealed installation.



PV10JX

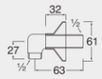


NEW



PT205
SHOWER ELBOW

- Useable to attach shower hose.



VN220A-2
PVN220A-2
ANGLE STOP VALVE

CR Series

- Ceramic cartridge type.

PVN220A-2

Note

PY Series — PINEAPPLE Series
Metal Handle Type | Chrome Finished

MR Series — miniCERA SERIES
Metal Handle Type | Chrome Finished

CR Series — Ceramic SPINDLE TYPE
Cartridge Head-Part
One-Touch Spin Handle
(90 Degrees)

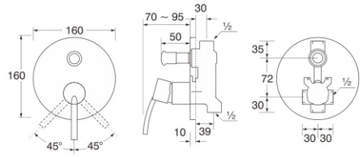
P — Plastic Packaging
Type-Code | 1 set/pack

Concealed Bath Mixer



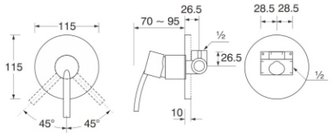
V101
CONCEALED
SINGLE LEVER
BATH MIXER

- With Change Lever to Wall Shower & to Bath Spout.





V100
CONCEALED
SINGLE LEVER
BATH MIXER



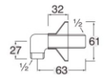
Shower Elbow



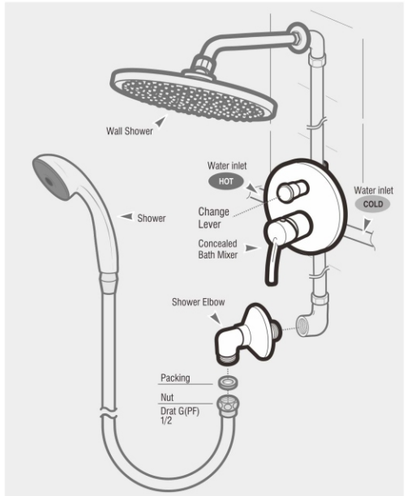
NEW

PT205
SHOWER ELBOW

- Useable to attach shower hose.







Stop Valves



V23
PV23
STOP VALVE

- Spindle kerep type.





PV23



V23JPR
PV23JPR
STOP VALVE

- Ceramic cartridge type.





PV23JPR



V20JPR
STOP VALVE

- Ceramic cartridge type.





V26JPR
STOP VALVE

- Ceramic cartridge type.

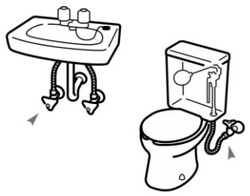


Note

PINEAPPLE Series
Metal Handle Type | Chrome Finished

Ceramic
Cartridge Head-Part
One-Touch Spin Handle
(90 Degrees)

Plastic Packaging
Type-Code | 1 set/pack

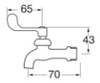


Economic series



EY25R
PEY25R
SINK TAP

- Double spindle kerep type.



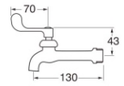


PEY25R



EY25R-L
PEY25R-L
SINK TAP

- Double spindle kerep type.





PEY25R-L



EY35R
PEY35R
SINK TAP with COUPLING

- Double spindle kerep type.



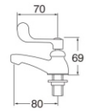


PEY35R



EY55R
PEY55R
BASIN TAP

- Double spindle kerep type.



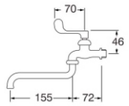


PEY55R



EA15R
PEA15R
SWINGING SINK TAP

- Double spindle kerep type.



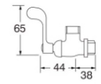


PEA15R



EV24R
PEV24R
SHOWER VALVE

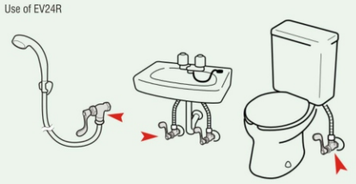
- Double spindle kerep type.





PEV24R

Use of EV24R



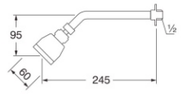
Shower Items

Wall Shower



S10
PS10
WALL SHOWER

- Adjustable shower head.



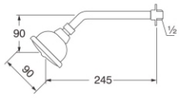


PS10



S19
PS19
WALL SHOWER

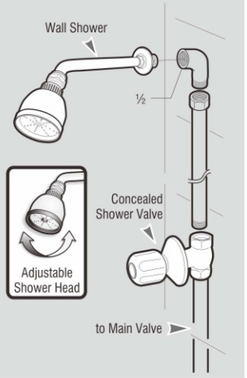
- Adjustable shower head.





PS19

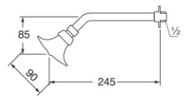
Wall Shower Installation





S11
PS11
WALL SHOWER

- Adjustable shower head.



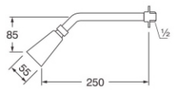


PS11



S18
PS18
WALL SHOWER

- Adjustable shower head.





PS18

Shower Valves

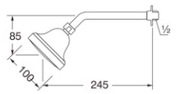


Relaxation Wall Shower



S12
PS12
RELAXATION WALL SHOWER

- Adjustable shower head.





Shower



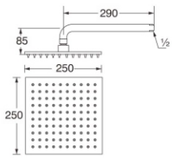
PS12

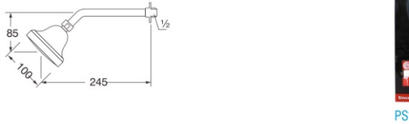
Rain Shower



S17S
RAIN SHOWER

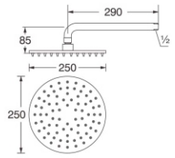
- Adjustable shower head.





S17C
RAIN SHOWER

- Adjustable shower head.



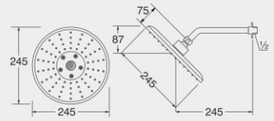
Relaxation Wall Shower



NEW

PS20
RELAXATION WALL SHOWER

- Adjustable shower head.
- Adjustable shower patterns.
- 3 (three) patterns by pushing the button.







Rain



Massage



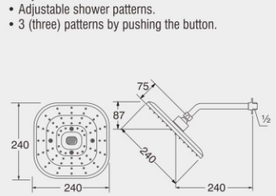
Rain & Massage



NEW

PS21
RELAXATION WALL SHOWER

- Adjustable shower head.
- Adjustable shower patterns.
- 3 (three) patterns by pushing the button.







Rain



Massage



Rain & Massage



S13
PS13
RELAXATION WALL SHOWER

- Adjustable shower head.
- Adjustable shower patterns.
- 4 (four) patterns by rotating rotating faceplate.



Rain

Massage & Rain



Massage

Stop & Drop

PS13

PS14
RELAXATION WALL SHOWER

- Adjustable shower head.

Shower



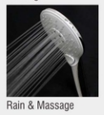




Rain



Massage



Rain & Massage

NEW

PS3610C
RELAXATION SHOWER SET

- Adjustable shower patterns.
- 3 (three) patterns by pushing the button.
- Metal hose length 1.5 m.
- Shower bracket included.



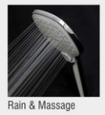




Rain



Massage



Rain & Massage

NEW

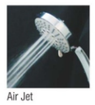
PS3620C
RELAXATION SHOWER SET

- Adjustable shower patterns.
- 3 (three) patterns by pushing the button.
- Metal hose length 1.5 m.
- Shower bracket included.









Air Jet



Air Jet & Rain



Rain



Rain & Massage



Massage



Stop & Drop

Mode : "**Stop & Drop**" to prevent damage due to high water pressure

PS3857C
RELAXATION SHOWER SET

- Adjustable shower patterns.
- 6 (six) patterns by rotating the faceplate.
- Metal hose length 1.5 m.
- Shower bracket included.

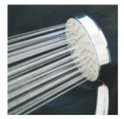
PS3857-80X
RELAXATION SHOWER HEAD

- Adjustable shower patterns.
- 6 (six) patterns by rotating the faceplate.









Rain

PS385C
RELAXATION SHOWER SET

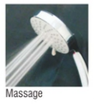
- Metal hose length 1.5 m.
- Shower bracket included.

PS385-80X
RELAXATION SHOWER HEAD

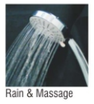








Massage



Rain & Massage



Rain



Stop & Drop

Mode : "**Stop & Drop**" to prevent damage due to high water pressure

PS3853C
RELAXATION SHOWER SET

- Adjustable shower patterns.
- 4 (four) patterns by rotating the faceplate.
- Metal hose length 1.5 m.
- Shower bracket included.







PS3960C
RELAXATION SHOWER SET

- Metal hose length 1.5 m.
- Shower bracket included.







Rain



Massage



Mist

PS3953C
RELAXATION SHOWER SET

- Adjustable shower patterns.
- 3 (three) patterns by rotating the faceplate.
- Metal hose length 1.5 m.
- Shower bracket included.





PS3950C
RELAXATION SHOWER SET

- Metal hose length 1.5 m.
- Shower bracket included.

Kolumn SERIES

PS310C
SHOWER SET

- Metal hose length 1.5m.
- Shower bracket included.

S310C
SHOWER SET

- Metal hose length 1.5m.
- Shower bracket included

PS310-80X
SHOWER HEAD

Jou-Sui
浄水

Water-Purifier Shower





NEW

PS7963C - MW2
WATER-PURIFIER SHOWER SET

- Water-Purifier cartridge (PM7163-1) included.
- Hose length 1.3 mtr.
- Shower bracket included.



NEW

PS7963C - CP6
WATER-PURIFIER SHOWER SET

- Water-Purifier cartridge (PM7163-1) included.
- Hose length 1.3 mtr.
- Shower bracket included.



NEW

PM7163-1
WATER-PURIFIER CARTRIDGE

- Calcium Sulfite.

Water Purifier Cartridge:
- **Removes Chlorine.**
- **Removes Synthetic Chemicals.**
- **Enhanced pH Balance.**
- **Eliminates Absorption of Harsh Chemicals.**

Water-Purifier Cartridge's Use Periods:
In the case of using **8 minutes per day**, the effect of the cartridge about **2 months**. It varies according to your water conditions, please replace water-purifier cartridge (code type: **PM7163-1**).

Free residual chlorine capacity about: **4,000 L** (Flow Rate: 8 L/min)

How to Replace the Cartridge



Water Filter



NEW

PM7230-B
CLEAN WATER

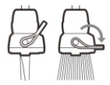




NEW

PM7240
WATER FILTER

- Three layers water filter with Carbon, Charcoal & Calcium.
- Water temperature max. 50°C.
- Changeable shower patterns.





PM7251
WATER FILTER

- Three layers water filter with Carbon, Charcoal & Calcium.
- Water temperature max. 45°C.
- Changeable shower patterns.



Hand Shower



WIDE Shower Spray

SAVE The WATER
Small holes make less water consuming and it works on low water pressure.



PSN351C
SHOWER SET



SN351C
SHOWER SET

- Hose length 1.3 mtr.
- Metal hose length 1.5 mtr. for PSN351C-CH/SN351C-CH
- Shower bracket included.







• Pastel Ivory (PI) • White (W) • Magenta (MG) • Chrome (CH)

PSN351-80X
SHOWER HEAD





PSN350C
SHOWER SET



SN350C
SHOWER SET

- Hose length 1.3 mtr.
- Metal hose length 1.5 mtr. for PSN350C-CH/SN350C-CH
- Shower bracket included.







• Pastel Ivory (PI) • White (W) • Magenta (MG) • Chrome (CH)

PSN350-80X
SHOWER HEAD





PSN353C
SHOWER SET



SN353C
SHOWER SET

- Hose length 1.3 mtr.
- Metal hose length 1.5 mtr. for PSN353C-CH/SN353C-CH.
- ECO-Shower head with On/Off button.
- Shower bracket included.





PSN353-80X
SHOWER HEAD

- ECO-Shower head with On/Off button.



• Pastel Ivory (PI) • White (W) • Magenta (MG) • Chrome (CH)





PSN355C
SHOWER SET



SN355C
SHOWER SET

- Hose length 1.3 mtr.
- ECO-Shower head with On/Off button.
- Shower bracket included.





PSN355-80X
SHOWER HEAD

- ECO-Shower head with On/Off button.



• Pastel Ivory (PI) • White (W) • Magenta (MG)





PS361C
SHOWER SET



S361C
SHOWER SET

- Hose length 1.3m.
- Shower head with On/Off button.
- Shower bracket included.





PS361-80X
SHOWER HEAD

- Shower head with On/Off button.



• Pastel Ivory (PI) • White (W)



桜 Sakura

Very **Light!**
105g
Shower Head



PSN357C
SAKURA-Series
SHOWER SET



SN357C
SAKURA-Series
SHOWER SET

- Hose length 1.3 mtr.
- Metal hose length 1.5 mtr. for PSN357C-CH/SN357C-CH.
- ECO-Shower head with On/Off button.
- Very light shower head, only 105gr.
- Shower bracket included.





PSN357-80X
SAKURA-Series
SHOWER HEAD

- ECO-Shower head with On/Off button.



• Magenta (MG) • White (W) • Pastel Ivory (PI) • Chrome (CH)





PSN77C
TOILET
SHOWER SET

- Hose length 1.2m.
- Shower bracket included.



SN77C
TOILET
SHOWER SET



PSN77-80X
TOILET
SHOWER HEAD



- Pastel Ivory (PI)
- White (W)
- Platinum Silver (PS)



- Black (BK)
- Magenta (MG)









PSN75C
TOILET
SHOWER SET

- Hose length 1.2m.
- Shower bracket included.



SN75C
TOILET
SHOWER SET



PSN75-80X
TOILET
SHOWER HEAD



- Pastel Ivory (PI)
- White (W)
- Platinum Silver (PS)



- Black (BK)
- Magenta (MG)
- Chrome (CH)

NEW







PS75C
TOILET
SHOWER SET

- Hose length 1.3m.
- Shower bracket included.



S75C
TOILET
SHOWER SET



PS75-80X
TOILET
SHOWER HEAD



- Pastel Ivory (PI)
- White (W)
- Black (BK)



Shower Hose



PS30-56X
METAL SHOWER HOSE

- Hose length: **1.5m, 2.0m**



PS30-76X
METAL SHOWER HOSE

NEW

- Hose length **1.5m, 1.2m**



PSN30-86X
SHOWER HOSE

- Hose length: **1.3m, 1.6m**
- Color : White.



PS30-86X
SHOWER HOSE

- Hose length: **1.6m**
- Color : White.

Shower Bracket

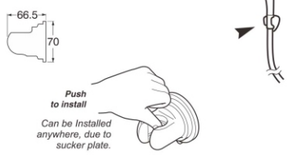


PSN34-85
SHOWER BRACKET





PS30-35
SHOWER BRACKET





PS30-45
SHOWER BRACKET

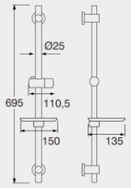
- Adjustable shower position.





W595S
SLIDE BAR

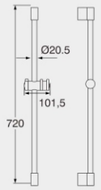
- Adjustable shower bracket.
- Adjustable soap dish.





W5950S
SLIDE BAR

- Adjustable shower bracket.





Rain | Massage | Rain & Massage

Rain | Massage | Rain & Massage

Change shower patterns by pushing the button.

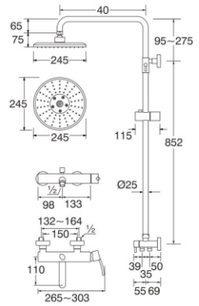


Adjustable column high: 95mm~275mm with stopper.

NEW

W7200-S
SINGLE LEVER BATH MIXER with COLUMN SHOWER SET

- Column set with change lever to wall shower or hand shower.
- Changeable wall shower pattern.
- Changeable hand shower pattern.
- Single lever bath mixer with change lever to column set or to bath spout.
- Adjustable column high: 95mm~275mm with stopper.





Rain | Massage | Rain & Massage

Rain | Massage | Rain & Massage

Change shower patterns by pushing the button.

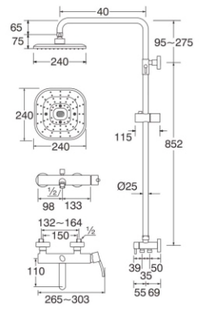


Adjustable column high: 95mm~275mm with stopper.

NEW

W7250-S
SINGLE LEVER BATH MIXER with COLUMN SHOWER SET

- Column set with change lever to wall shower or hand shower.
- Changeable wall shower pattern.
- Changeable hand shower pattern.
- Single lever bath mixer with change lever to column set or to bath spout.
- Adjustable column high: 95mm~275mm with stopper.





Rain | Massage | Rain & Massage

Rain | Massage | Rain & Massage

Change shower patterns by pushing the button.

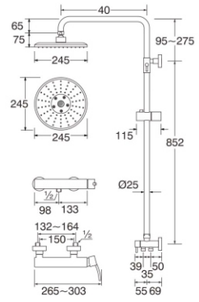


Adjustable column high: 95mm~275mm with stopper.

NEW

W7700-S
SINGLE LEVER BATH MIXER with COLUMN SHOWER SET

- Column set with change lever to wall shower or hand shower.
- Changeable wall shower pattern.
- Changeable hand shower pattern.
- Single lever bath mixer.
- Adjustable column high: 95mm~275mm with stopper.





Rain | Massage | Rain & Massage

Rain | Massage | Rain & Massage

Change shower patterns by pushing the button.

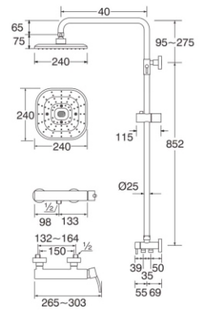


Adjustable column high: 95mm~275mm with stopper.

NEW

W7750-S
SINGLE LEVER BATH MIXER with COLUMN SHOWER SET

- Column set with change lever to wall shower or hand shower.
- Changeable wall shower pattern.
- Changeable hand shower pattern.
- Single lever bath mixer.
- Adjustable column high: 95mm~275mm with stopper.





Shower



Air Jet | Air Jet & Rain | Rain



Rain & Massage | Massage | Stop & Drop

Mode : "**Stop & Drop**" to prevent damage due to high water pressure

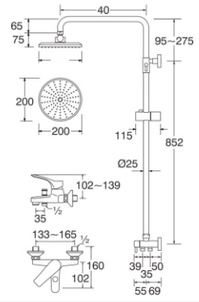


Adjustable column high: 95mm~275mm with stopper.

NEW

W7900-S
SINGLE LEVER BATH MIXER with COLUMN SHOWER SET

- Column set with change lever to wall shower or hand shower.
- Changeable hand shower pattern.
- Single lever bath mixer with change lever to column set or to bath spout.
- Adjustable column high: 95mm~275mm with stopper.





Rain | Massage | Rain & Massage

Rain | Massage | Rain & Massage

Change shower patterns by pushing the button.

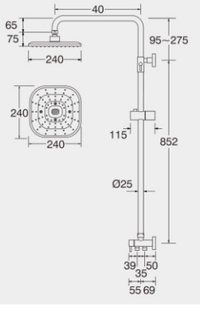


Adjustable column high : 95mm~275mm with stopper

NEW

W7750-X
COLUMN SHOWER SET

- Column set with change lever to wall shower or hand shower.
- Changeable wall shower pattern.
- Changeable hand shower pattern.
- Adjustable column high: 95mm~275mm with stopper.



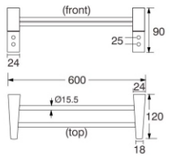
Accessories

Towel Holder





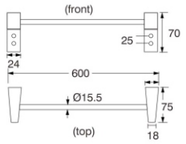
PWN532
DOUBLE TOWEL HOLDER







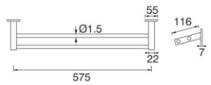
PWN531
TOWEL HOLDER







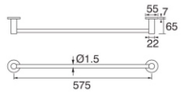
PWN5320
DOUBLE TOWEL HOLDER







PWN5310
TOWEL HOLDER

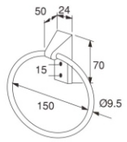


Towel Ring





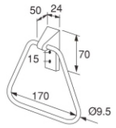
PWN530
TOWEL RING







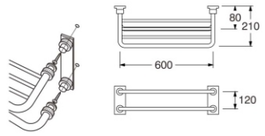
PWN533
TOWEL RING



Towel Shelf

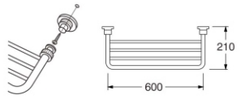


WN22
COMBINATION TOWEL SHELF





WN21
TOWEL SHELF

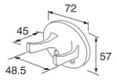


Hook





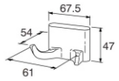
WN883
PWN883
DOUBLE HOOK





PWN883

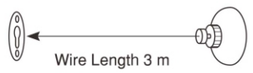
WN882
PWN882
DOUBLE HOOK



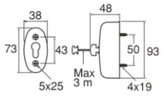


PWN882



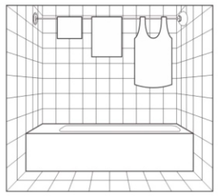


W540
PW540
CLOTHES LINE





PW540





Note

P Plastic Packaging
Type-Code | 1 set/pack

Paper Holder





PWN30

WN30
PWN30
PAPER HOLDER







PW33

W33
PW33
PAPER HOLDER

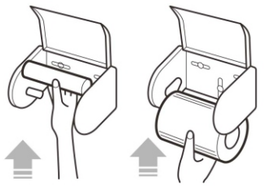






PW372
ONE TOUCH PAPER HOLDER





One Touch
to replacing disposable
Toilet paper rolls

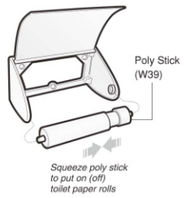




W39
PW39
PAPER HOLDER POLY STICK

- Useable for WN30/PWN30 & W33/PW33





PW39

Soap Dispenser





PW161

W161
PW161
SOAP DISPENSER

- Tube capacity 350ml.







PW101

W101
PW101
SOAP DISPENSER

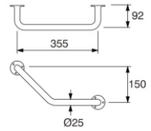
- Tube capacity 350ml.



Grip Bar

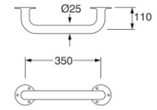


WN59-2
GRIP BAR





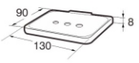
WN59
GRIP BAR



Soap Dish



PWN180
SOAP DISH





PWN180



PWN185
SOAP DISH

PWN185



W731
PW731
ASHTRAY / SOAP DISH

PW731





W111
PW111
SOAP DISPENSER

- Tube capacity 350ml.





PW111

Note

P **Plastic Packaging**
Type-Code | 1 set/pack

Utility Items

Strainer



HN508
PHN508
SQUARE FLOOR STRAINER 4 X 2"

- With locking plate.



PHN508





HN51
PHN51
FLOOR STRAINER 4 X 2"

- With locking plate.



PHN51





HN508P
PHN508P
SQUARE FLOOR STRAINER 4 X 2"

- With locking plate.
- Body strainer made of ABS.



PHN508P





HN51P
PHN51P
FLOOR STRAINER 4 X 2"

- With locking plate.
- Body strainer made of ABS.



PHN51P



Note

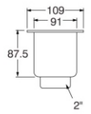
P	**Plastic Packaging**
	Type-Code | 1 set/pack



NEW

HN508-L
SQUARE
FLOOR STRAINER 4 X 2"

- With locking plate.





PHN51F
STRAINER PLATE

- Useable for body strainer type:
  HN51 / HN508 / HN51P / HN508P / HN508-L.





Tools

NEW

R391
SAW

- Useable to cut pipe
  (steel, PVC or tin)



NEW

R391-F
BLADE

- Useable to cut pipe
  (steel, PVC or tin)





H51-M
FLOOR STRAINER
4¼ X 3"

- With locking plate.
- Anti-Rat strainer.



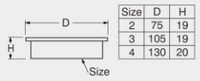


SAN-EI



NEW

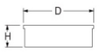
HN59
SQUARE FLOOR CLEAN-OUT
2, 3, 4"



Size	D	H
2	75	19
3	105	19
4	130	20



HN58
FLOOR
CLEAN-OUT
2, 3, 4, 6"



	D	H
2	65	18
3	92	18
4	117	19
6	170	24



PHN58
FLOOR
CLEAN-OUT 4"



HN480
FLOOR STRAINER
3½ X 2"



Tools

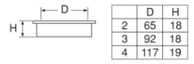


PR370
CLEAN-OUT
WRENCH





HN43
FLOOR STRAINER
2, 3, 4"



	D	H
2	65	18
3	92	18
4	117	19

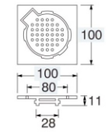


HN941-100
PHN941-100
S/S FLOOR STRAINER 4"



PHN941-100

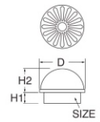
NEW Design
JAPAN's Design





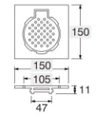
H01
ROOF DRAIN
2, 3, 4"

SIZE	D	H1	H2
2"	70	17	34
3"	100	20	44
4"	124	30	58





HN941-150
S/S FLOOR STRAINER 6"



SAN-EI

Drain Hose




PH62-860
DRAIN HOSE
1.0, 1.5, 2.0, 3,0m

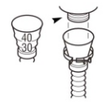
- Max. temp. 60°C.






PH62-861
DRAIN HOSE
1.0, 1.5m

- Max. temp. 60°C.



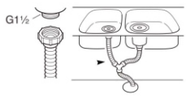


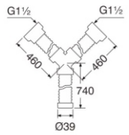




PH62-862
Y-TYPE DRAIN HOSE

- Max. temp. 60°C.

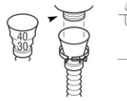


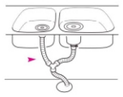
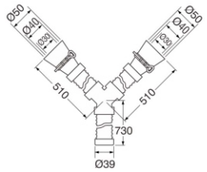





PH62-863
Y-TYPE DRAIN HOSE

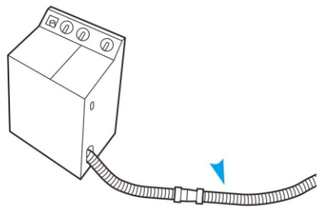
- Max. temp. 60°C.





PH64-861T
DRAIN HOSE
(for Washing Machine)
1.0, 1.5, 2.0, 3.0m



Note

P	Plastic Packaging
	Type-Code | 1 set/pack

Sink Strainer



H650
SINK STRAINER

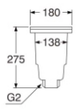
- With basket strainer inside.
- Max. temp. 60°C.





H650A
SINK STRAINER

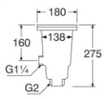
- With basket strainer inside.
- Max. temp. 60°C.





H651A
SINK STRAINER

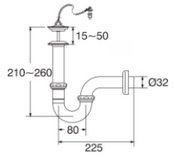
- With basket strainer inside.
- Max. temp. 60°C.



Basin Trap



HN71
PHN71
P-TRAP



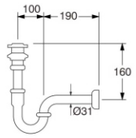


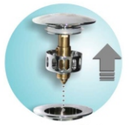
PHN71



HN77
PHN77
P-TRAP

- Pull-up type.
- Easy to clean.



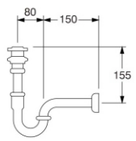

Un-Plug
to clean up.

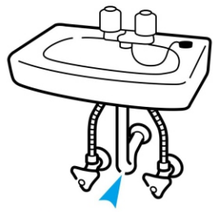


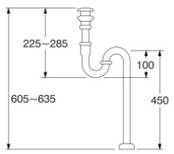
PHN77

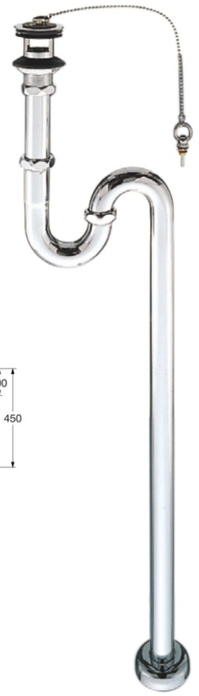


H71
P-TRAP




HN77 / HN71 / H71





H70
S-TRAP

Parts & Tools



PP79-1S
TAPE

- Usable for washbowl/washbasin to prevent leaks.




PH392
BASIN STRAINER

PR803-1
S-TRAP CLEANER

- Usable for washbowl /washbasin.

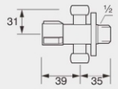
Stop Valve



NEW

VN230
PVN230
STOP VALVE

- Spindle kerep type.



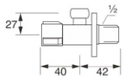


PVN230



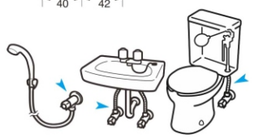
VN220
PVN220
STOP VALVE

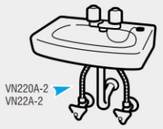
- Ceramic cartridge type.





PVN220







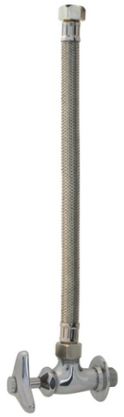
Note

P	**Plastic Packaging**
	Type-Code | 1 set/pack

VN22A-2
PVN22A-2
ANGLE STOP VALVE

- Spindle kerep type.







PVN22A-2

VN220A-2
PVN220A-2
ANGLE STOP VALVE

- Ceramic cartridge type.





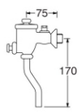


PVN220A-2

Flush Valve



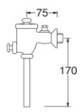
V92
URINAL FLUSH VALVE







V93
URINAL FLUSH VALVE

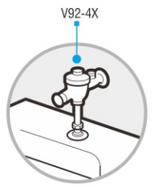




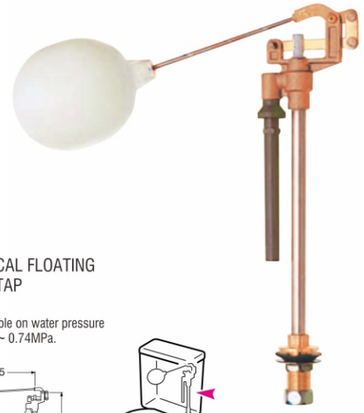


V92-4X
PISTON VALVE
(for Urinal Flush Valve)

- Maintenance Parts for Urinal Flush Valve.

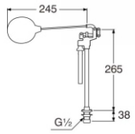


Toilet Tank Parts



V48
VERTICAL FLOATING BALL TAP

- Workable on water pressure 0.098 ~ 0.74MPa.



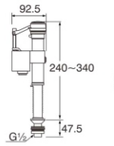






V538-5X
VERTICAL FLOATING BALL TAP

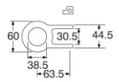
- Adjustable Floating to save the water.

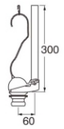






PH841-92X
LOW-TANK RUBBER FLOAT

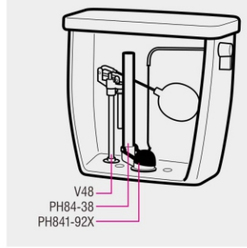




PH84-38
LOW-TANK SIPHON



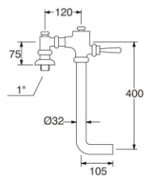


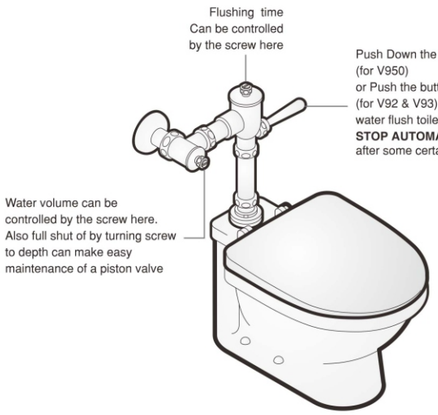


How it Works



V950
FLUSH VALVE for W.C.

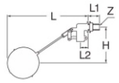




VN44J
PVN44J
BALL TAP
½, ¾, 1"



- Max. water pressure **0.75MPa.**
- Tap & Stick made of **Brass.**
- Floating Ball made of **HDPE**
  (High-Density PolyEthylene).
- Valve Body: **JIS** Design
  (Japan Industrial Standar Design).
- Heavy duty tap with **Vertical Leverage** system.

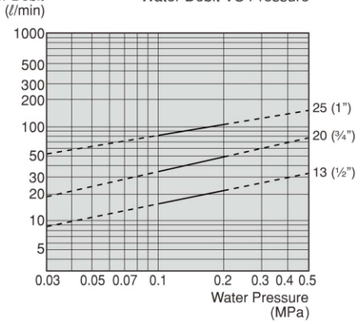


	L	L1	L2	H	Z	R.Ball	Stick
13 (½")	305	35	25	130	G½	105	160
20 (¾")	380	35	40	180	G¾	115	220
25 (1")	520	38	49	240	G1	115	330

PVN44J



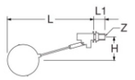
Water Debit (ℓ/min) — Water Debit VS Pressure



VN41
PVN41
BALL TAP
½, ¾, 1"



- Max. water pressure **0.5MPa.**
- Tap & Stick made of **Brass.**
- Floating Ball made of **HDPE**
  (High-Density PolyEthylene).

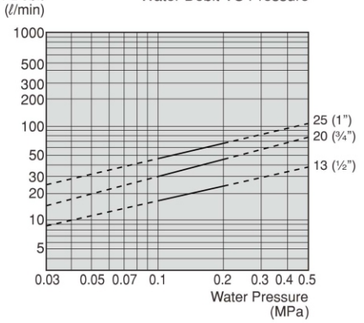


	L	L1	H	Z	R.Ball	Stick
13 (½")	305	34	100	G½	105	160
20 (¾")	380	36	100	G¾	115	220
25 (1")	500	38	60	G1	115	330

PVN41



Water Debit (ℓ/min) — Water Debit VS Pressure



Note

P **Plastic Packaging**
Type-Code | 1 set/pack

Spareparts





PVN41-84-**105**
PVN41-84-**115**
FLOATING BALL
(Ball Tap Sparepart)

- Made of HDPE (High-Density PolyEthylene).
- Dia. 105mm : useable for ball tap size : ½ & ¾".
- Dia. 115mm : useable for ball tap size : 1".



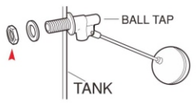




PT726
LOCK NUT
SIZE : ¾, 1"

SIZE	L
3/4	40
1	49





NEW

V57
BALL TAP
1, 1¼, 1½, 2"

- Floating ball : **Stainless Steel** (**SUS316**).
- Maximum water temperature **120°C.**
- Workable on water pressure
  0.098 ~ 0.74MPa (**1 ~ 7.5Kgf/cm²**).
- For V57 size 2", use rounded floating ball.
- Size 1¼, 1½, 2" : does not have a mounting nut.





V52
BALL TAP
NEW NEW
½, ¾, 1, 1¼, 1½, 2"

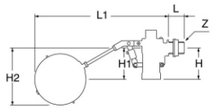
- Floating ball : **HDPE.**
  (High-Density PolyEthylene)
- Maximum water temperature **60°C.**
- Workable on water pressure
  0.098 ~ 0.74MPa (**1 ~ 7.5Kgf/cm²**).
- Size 1¼, 1½, 2" : does not have a mounting nut.



V51
BALL TAP
1½

- Floating ball : **Cooper.**
- Maximum water temperature **60°C.**
- Workable on water pressure
  0.098 ~ 0.74MPa (**1 ~ 7.5Kgf/cm²**).





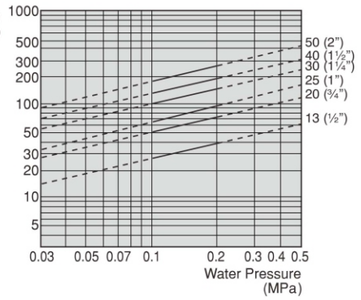
Product Measure V57, V52, V51

	L1		L	H	H1	H2	Z	R.Ball	Pole
	When the water discharge	When sealing			When sealing	When the water discharge			Length X Dia.
13 (½")	205 ~ 251	307 ~ 337	30	48	52 ~ 116	230 ~ 260	PJ1/2	95	160X6
20 (¾")	153 ~ 220	332 ~ 374	35	72	140 ~ 185	330 ~ 335	PJ3/4	115	200X6
25 (1")	172 ~ 240	345 ~ 395	35	78	150 ~ 210	330 ~ 335	PJ1	115	200X6
30 (1¼")	170 ~ 250	359 ~ 413	22	84	110 ~ 190	340 ~ 355	R11/4	115	220X6
40 (1½")	310 ~ 458	460 ~ 575	23	85	55 ~ 253	309 ~ 430	R11/2	135	300X8
50 (2")	305 ~ 454	496 ~ 610	26	98	69 ~ 278	370 ~ 485	R2	150	300X8

L1, H1 during hydrostatic pressure 0.3MPa

■ V51, V52, V57

Water Debit (ℓ/min) — Water Debit VS Pressure



NEW

T10
S/S FLEXIBLE PIPE ½"
1.500, 2.000, 3.000,
5.000 (mm)









T10
S/S FLEXIBLE PIPE ½"
150, 200, 250, 300,
350, 400, 500, 600,
800, 1.000 (mm)

PT10
S/S FLEXIBLE PIPE ½"
150, 200, 250, 300,
350, 400, 500, 600,
800, 1.000 (mm)



T10
S/S FLEXIBLE PIPE ¾"
200, 300, 400, 500 (mm)

- Maximum pressure 1.72MPa.
- Maximum temperature 90°C.
- Material : stainless steel.



T193
S/S FLEXIBLE PIPE ½"
200, 250, 300, 350, 400,
500, 600, 1.000 (mm)

PT193
S/S FLEXIBLE PIPE ½"
200, 250, 300, 350, 400,
500, 600, 1000 (mm)



- Maximum pressure 0.98MPa.
- Maximum temperature 70°C.
- Material outside : stainless steel.
  inside : PVC.

Note

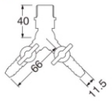
P	Plastic Packaging
	Type-Code | 1 set/pack

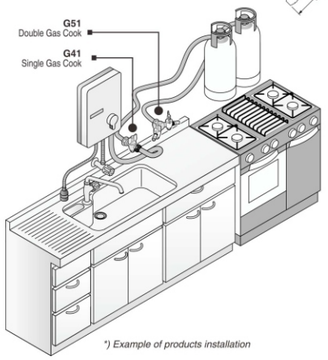
Gas Cook



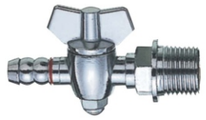


G51
PG51
DOUBLE GAS COOK



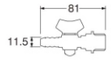


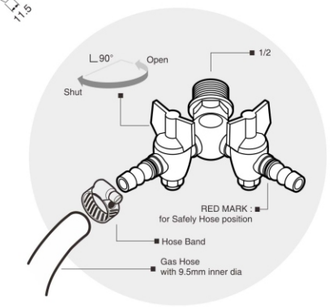
*) Example of products installation





G41
PG41
SINGLE GAS COOK



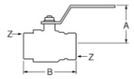


Specifications	
Connection to main piping	**1/2" male thread**
Connection to gas hose	**for 9.5mm inner dia. gas hose**
Material	**Zinc Diecasting**
Surface finish	**Chrome Plating**
Lubricant	**Silicon Grease**
Operation of open and shut	**90 degree turning from Open to Shut position**
Operation Torque	**Less than 40N cm**
Pressure testing	**34.3 kPa/air**



V650F
BALL VALVE
½, ¾, 1"

- Useable for OIL or WATER valve
- Workable max. 2.74MPa (28kgf/cm²)

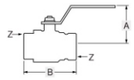


	A	B	Z
½	47	50	Rc-½
¾	54	57	Rc-¾
1	59	67	Rc-1

PV650F
BALL VALVE
½, ¾, 1"



VN650F
BALL VALVE
½, ¾"



	A	B	Z
½	42	44	Rc-½
¾	44	49	Rc-¾

V61
PV61
BALL VALVE
½, ¾"





PV61



V62-X
PV62-X
BALL VALVE







PV62-X

V66
PV66
BALL VALVE





PV66

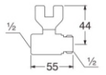


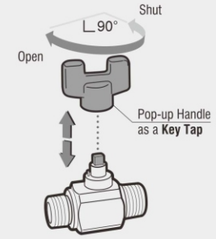
V64
PV64
BALL VALVE





PV64





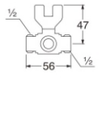
- Pop-up handle as a **Key Tap**
- Maximum water pressure **1 MPa**
- Workable on temp. **-20°C ~ 90°C**

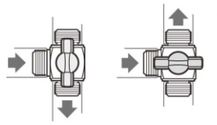
V63
PV63
BALL VALVE





PV63

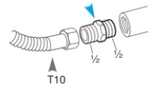







PT20
NIPPLE ½”

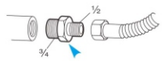







PT201
NIPPLE ¾ X ½”





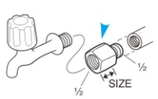



PT22C
SOCKET ½”
SIZE:
15, 20, 25,
30, 40 (mm)



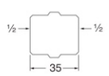


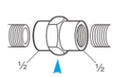

PT253
SOCKET ½”
SIZE:
15, 20, 25,
30, 40 (mm)






PT21
SOCKET ½”

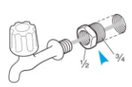







PT24
BUSHING ½ X ¾”

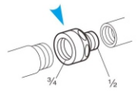







PT241
BUSHING ¾ X ½ ”

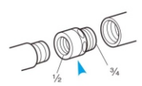







PT25-51
BUSHING ½ X ¾”

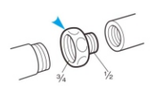







PT25-5
BUSHING ¾ X ½ ”








PT760
PLUG ½”








PT780
CAP NUT ½”

PT71
PLUG ½”

PT6-6X
TEE with NUT ½”

PT79
TEE ½”

PT77
TEE ½”

PT73
ELBOW ½”

PT72
ELBOW ½”

PT79-4
CROSS TEE ½”

PT202
ELBOW ½”

PT204-5
ELBOW with NUT ½”

PT726
LOCK NUT
SIZE : ¾, 1”

SIZE	L
¾	40
1	49

PD10-MH6 (8 ~ 22mm)
PD10-HS10 (14 ~ 27mm)
HOSE BAND

- 2 pcs/pack.
- Material Stainless steel.

PD10-MH6 (8~22mm)
PD10-HS10 (14~27mm)

NEW

PT205
SHOWER ELBOW

- Useable to attach shower hose.

Garden Items

Sprinkler





CN33
SPRINKLER

Water Preasure	MPa	0.1	0.2
Water Debit	L/mim	11.5	15.5
Heigh	m	2.0	2.3
Radius	m	10.0	12.0



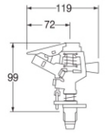




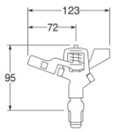
C517F
SPRINKLER

- Adjustable water spray type : Mist water spray & Straight Spray.
- Adjustable water spray radius : 9.0~20 mtrs.
- Adjustable water spray rotation.

Water Preasure	MPa	0.1	0.2	0.3
Water Debit	L/mim	9.5	13.5	16.0
Radius	m	9.0	19.0	11.0







C520F
SPRINKLER

Water Preasure	MPa	0.1	0.2	0.3
Water Debit	L/mim	16.0	22.0	26.0
Radius	m	13.0	22.0	25.0

Garden Tap



Y70J
PY70J
SINK TAP with COUPLING

- Spindle kerep type.





PY70J



Y30J
PY30J
SINK TAP with COUPLING

- Spindle kerep type.





PY30J

Note

P Plastic Packaging
Type-Code | 1 set/pack

Nozzle



PN51
NOZZLE

- Adjustable shower spray.



STRAIGHT
SHOWER
STOP



PN550
NOZZLE

- Adjustable shower spray.





STRAIGHT
MIST WATER
STOP



PN560
NOZZLE

- Adjustable shower spray.
- Removable spray head.



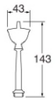


SHOWER
MIST WATER
STRAIGHT
STOP

Fountain



C14
LOTUS FOUNTAIN





Water Preasure	Kgf/cm2	1	2
Water Debit	L/mim	9.5	12.6
Heigh	m	5.0	6.3
Radius	m	4.2	4.2



C20
CROSS FOUNTAIN



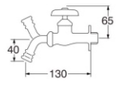


Water Preasure	Kgf/cm2	1	2
Water Debit	L/mim	9.5	12.0
Heigh	m	4.0	5.9
Radius	m	2.5	2.5



Y12J
PY12J
ALL ROUND SINK TAP

- Spindle kerep type.







PY12J



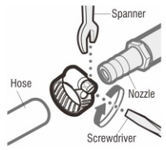


PD10-MH6 (8 ~ 22mm)
PD10-HS10 (14 ~ 27mm)
HOSE BAND

- 2 pcs/pack.
- Material Stainless steel.



PD10-MH6 (8~22mm)
PD10-HS10 (14~27mm)



Sanitary Accessories



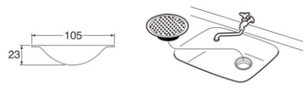


PH621-M
MESH STRAINER





PH625-L
BASKET STRAINER







PH620F-L
BASKET STRAINER







PH62F-L
BASKET STRAINER







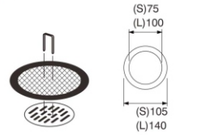
PH697F-S
BASKET STRAINER







PH95
MESH STRAINER
S(75mm)
L(100mm)





H650
SINK STRAINER

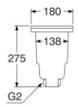
- With basket strainer inside.
- Max. temp. 60°C.





H650A
SINK STRAINER

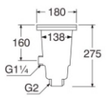
- With basket strainer inside.
- Max. temp. 60°C.





H651A
SINK STRAINER

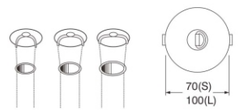
- With basket strainer inside.
- Max. temp. 60°C.







PH40F-2
STRAINER PLATE
S(70mm)
L(100mm)







PH69
SINK STOPPER







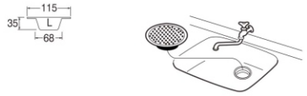
PH392
BASIN STRAINER







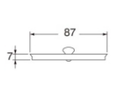
PH6210F-L
BASKET STRAINER







PH65F-3
SINK DRAIN STRAINER





PH65-9
SINK DRAIN STRAINER

PH63-9S
RUBBER CUP SET

PH6530F
DRAIN COVER

PH395-M (100)
HAIR CATCHER





NEW

PM7230-B
CLEAN WATER





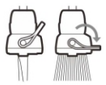


NEW

PM7240
WATER FILTER

- Three layers water filter with Carbon, Charcoal & Calcium.
- Water temperature max. 50°C.
- Changeable shower patterns.



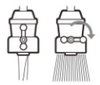




PM7251
WATER FILTER

- Three layers water filter with Carbon, Charcoal & Calcium.
- Water temperature max. 45°C.
- Changeable shower patterns.







PM23
HOME FILTER







• Red

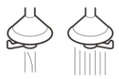


• Blue



PM261
TOP SHOWER

- Changeable shower patterns.





• White



• Blue

PM202A
TOP FILTER





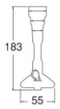




PM204
KITCHEN SHOWER

- Changeable shower patterns.





Tools & Spareparts



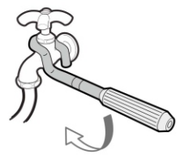


PR370
CLEAN-OUT WRENCH





PR36
SINK TAP SPANNER





NEW

R391
SAW

- Useable to cut pipe (steel, PVC or tin)



NEW

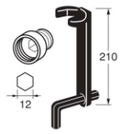
R391-F
BLADE

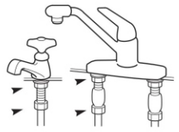
- Useable to cut pipe (steel, PVC or tin)





PR351
BASIN TAP SPANNER



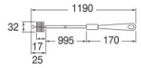






PR803-1
S-TRAP CLEANER

- Usable for washbowl/washbasin.





NEW

P75-1S-10
SEAL TAPE

- 10 pcs per-box.
- Tape Thickness 0.1mm.
- Tape Width 13mm.
- Tape Length 10 Mtrs.
- Made of PTFE.







PP75-1S-10
SEAL TAPE

- Tape Thickness 0.1mm.
- Tape Width 13mm.
- Tape Length 10 Mtrs.
- Made of PTFE.





PP79-1S
TAPE

- Usable for washbowl/washbasin to prevent leaks.

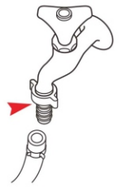








PT30A
HOSE NIPPLE





PR32
KEY TAP





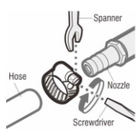




PD10-MH6 (8 ~ 22mm)
PD10-HS10 (14 ~ 27mm)
HOSE BAND

- 2 pcs/pack.
- Material Stainless steel.



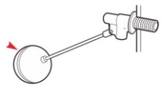






PVN41-84-**105**
PVN41-84-**115**
FLOATING BALL (Ball Tap Sparepart)

- Made of HDPE.
- Dia. 105mm : useable for ball tap size : ½ & ¾".
- Dia. 115mm : useable for ball tap size : 1".

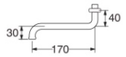


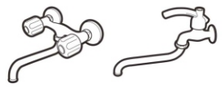




PA10J-60X
SPAREPART PIPE

Useable for :

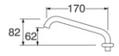






PA27J-60X
SPAREPART PIPE

Useable for :







PA26J-60X
SPAREPART PIPE

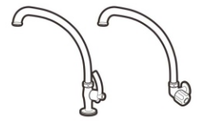
Useable for :

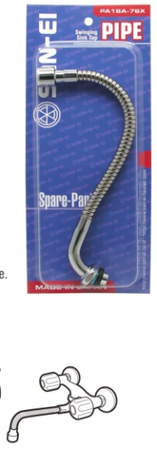




PA29J-60X
SPAREPART PIPE

Useable for :

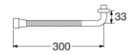




PA18A-76X
SPAREPART PIPE

- Effervescent water flow with Water Filter.
- Stainless Steel Flexible pipe.
- Water temp. Max. 60°C.

Useable for :



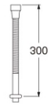




PA286A-76X
SPAREPART PIPE

- Effervescent water flow with Water Filter.
- Stainless Steel Flexible pipe.
- Water temp. Max. 60°C.

Useable for :









PR20F
METAL HANDLE

- For faucet with Spindle kerep type.
- Metal Handle Type, Chrome Finished.







PR27F
CRYSTAL HANDLE

- For faucet with Spindle kerep type







PR29F
CRYSTAL HANDLE

- For faucet with Spindle kerep type.







PR23FL
LEVER HANDLE

- For faucet with Double spindle kerep type.
- Metal Handle Type, Chrome Finished.







PR23F
LEVER HANDLE

- For faucet with Double spindle kerep type.
- Metal Handle Type, Chrome Finished.

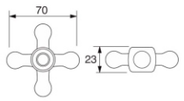






PR250F
CROSS HANDLE

- For faucet with Spindle kerep type.
- Metal Handle Type, Chrome Finished.



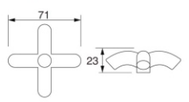
PINEAPPLE Series





PR220F
PINEAPPLE HANDLE

- For faucet with Spindle kerep type.
- Metal Handle Type, Chrome Finished.





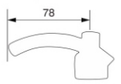
Samurai series





PR255F
SAMURAI HANDLE

- For faucet with Ceramic cartridge type or Double spindle kerep type.
- Metal Handle Type, Chrome Finished.



miniCERA SERIES





PR235F
MINICERA HANDLE

- For faucet with Ceramic cartridge type.
- Metal Handle Type, Chrome Finished.



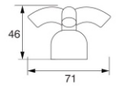
PINEAPPLE Series





PR225F
PINEAPPLE HANDLE

- For faucet with Ceramic cartridge type.
- Metal Handle Type, Chrome Finished.



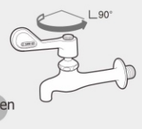
Faucets Mechanism

Kerep Type

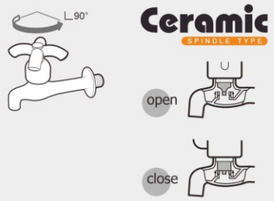
Spindle Kerep Type



Double Spindle Kerep Type



Ceramic Cartridge Type



Maintenance Parts





P84S
KEREP

1 Sheet pack (25pcs)

- Water saving function.
- For order 1 Sheet pack (25 pcs) only.



Ceramic
SPINDLE TYPE





PR501
CERAMIC CARTRIDGE

- Cartridge Head-Part "One-Touch Spin Handle" (90 Degrees). L 90°

PU-36-1
SPINDLE 45mm

- Useable for Faucets with "Spindle Kerep Type".

PU-38-1
DOUBLE SPINDLE 45mm

- Useable for Faucets with "Double Spindle kerep type".

PP-12A-2S
RUBBER PACKING for SPINDLE

PU-37-1
SPINDLE 85mm

- Useable for Concealed Valve with "Spindle Kerep Type".

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Nomor 030/SD-MHS/V/2019

Kepada Yth
Pokja 4 Kontruksi dan Konsultasi UNDIP 2019
Gedung Widya Purnaya Lt 1 UNDIP

Yang bertanda tangan dibawah ini

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Jabatan	: Direktur
Perusahaan	: PT. Marksindo Hidup Sejahtera
Alamat	: Jl. Raden Patah No.165 Semarang
Telp./Fax.	: (024) 86400777

Selaku Distributor Aluminium Composite Panel bersedia mendukung sepenuhnya kepada

Nama	: MAS'UD AZIZI
Jabatan	: Direktur CV Barokah Jaya
Alamat	: Lingk. Daleman Asri RT 003 RW 004 Mungseng Temanggung
Telp./Fax.	: 082138758584

Dalam pengadaan **Aluminium Composite Panel (ACP) Merk SEVEN** sesuai dengan spesifikasi kebutuhan yang diperlukan pada pekerjaan **"Konstruksi Pembuatan Jembatan Penghubung Gedung A dan Gedung H Fakultas Hukum Universitas Diponegoro-Semarang Tahun Anggaran 2019"**
CV Barokah Jaya ditunjuk sebagai pemenang dalam pelelangan tersebut diatas, maka kami akan melaksanakan pengadaan material tersebut diatas, sesuai dengan perjanjian yang akan dibuat kemudian.
Demikian surat dukungan ini dibuat untuk dapat digunakan sebagaimana mestinya.

Semarang, 20 Mei 2019
PT. MARKSINDO HIDUP SEJAHTERA



Lukito Suhardjo
Direktur

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Aluminium Composite Panel
Aluminium Roof System

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SEVEN

Product Application Projects



Olympic stadium,Moskow,Russia



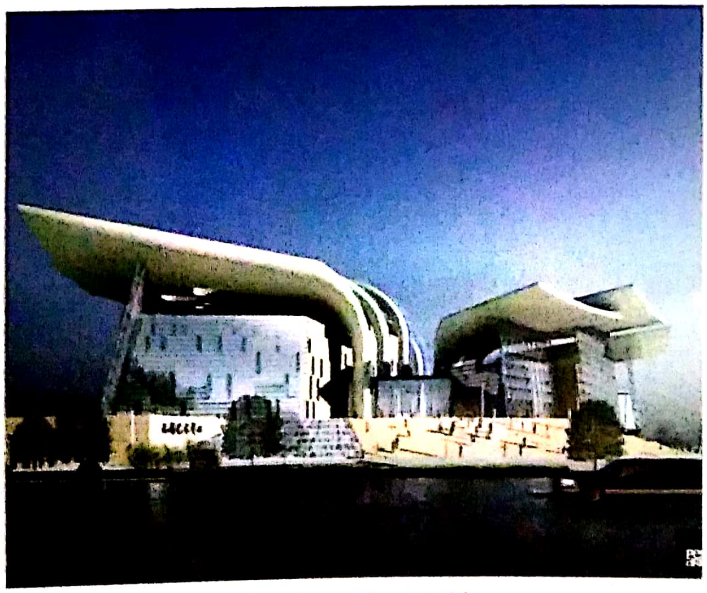
Apartment, Australia



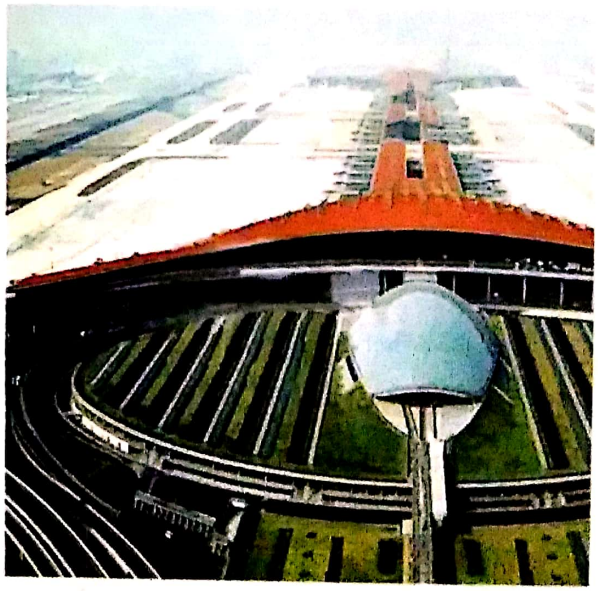
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Wuxi International Theater China



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SEVEN

test report of exterior

No.	test item		standard index: high-class	standard index: qualified class	test value	single item determination
1.	appearance quality	vestige	indistinct	indistinct	indistinct	high-class
		coating omit	not allowed	not allowed	no	high-class
		ripples	not allowed	indistinct	no	high-class
		rubbles(≤10mm)	not allowed	≤ 1/m²	no	high-class
		flaw(≤ 3mm)	≤ 3/m²	≤ 10/m²	no	high-class
		abrasion	not allowed	total length ≤ 100/m²	no	high-class
		scratch	not allowed	total area ≤ 400/m²	no	high-class
		total number of abrasion and scratch	not allowed	≤4	0	high-class
		aberration	indistinct	indistinct	indistinct	high-class
2.	dimensions deviation	length	± 1mm		mm~+1.3mm	passed
		width	±2mm		mm~+1.1mm	passed
		thickness	±0.2mm		+0.04mm~+0.20mm	passed
		squareness	≤5mm		1.2mm	passed
		edge unstraightness	≤1mm/m		0.15mm/m	passed
		warpage	≤5mm/m		1.3mm/m	passed
3.	coating thickness		2 coat min ≥25μm		27 μ m average 28 μ m	passed
			3 coat min ≥32μm		36 μ m average 35 μ m	passed
4.	gloss tolerance		≤10(gloss>70)≤5(gloss≤70)		1.8(golss=42.2)	passed
5.	pencil hardness		≥HB		3H	passed
6.	coating flexibility		≤2T		0T	passed
7.	coating adhesive		not lower than class 1		class0	passed
8.	impact resistance		50Kg.cm no depainting,no crack		50Kg.cm no depainting,no crack	passed
9.	grinding resistance		≥9L/μm		12.9L/um	passed
10.	boiling water resistance		no change		no change	passed
11.	pullute resistance		≤15%		2.5%	passed
12.	acid resistance		no change		no change	passed
13.	alkaline resistance		no change		no change	passed
14.	oil resistance		no change		no change	passed
15.	solvent resistance		no change		no change	passed
16.	scrub resistance		no change when ≥1000 times		no change when 10000 times	passed
17.	face density		specifide value± 0.5Kg/m³		5.59Kg/m³	passed
18.	bending strength		≥100MPa		124.5MPa	passed
19.	bending elastic modulus		≥2.0×104MPa		3.20×104MPa	passed
20.	penetration resistance		≥9.0KN		9.8KN	passed
21.	shearing strength		≥28.0MPa		29.8MPa	passed
22.	180° peel stregth		≥7.0N/mm		13.7N/mm	passed
23.	temperature cycle resistanee		no change		no change	passed
24.	thermal expansion coefficient		≤4.00×10-5℃-1		7.9×10-6-℃-1	passed
25.	heat distortion temperature		≥105℃		105℃	passed
26.	resistance salt spray		≤grade 2		1 grade	passed
27.	artificial weathering	colour differences	≤3.0		1.05	passed
		degradation of gloss	≤grade 2		1 grade	passed
		others	0 grade		0 grade	passed

test report of interior

NO.	testitem		standard index: high-class	standard index: qualified class	test value	single item determination
1.	appearance quality	vestige	indistinct	indistinct	indistinct	high-class
		coating omit	not allowed	not allowed	no	high-class
		ripples	not allowed	indistinct	no	high-class
		rubbles(≤10mm)	not allowed	≤1/m²	no	high-class
		flaw(≤3mm)	≤3/m²	≤10/m²	no	high-class
		abrasion	not allowed	total length≤100mm/m²	no	high-class
		scratch	not allowed	total area≤300mm²/m²	no	high-class
		total number of abrasion and scratch	not allowed	≤4	0	high-class
		aberration	indistinct	indistinct	indistinct	high-class
2.	dimensions deviation	length	±3mm		0mm~+1.7mm	passed
		width	±2mm		0.1mm~+1.2mm	passed
		thickness	±0.2mm		+0.8mm~+0.12mm	passed
		squareness	≤5mm		1.2mm	passed
		edge unstraightness	≤1mm/m		0.20mm/m	passed
		warpage	≤5mm/m		1.2mm/m	passed
3.	coating thickness		min≥16μm		19 μ m average 20 μ m	passed
4.	gloss tolerance		≤10(gloss>70)		2.0(gloss=25.8)	passed
5.	pencil hardness		≥HB		3H	passed
6.	coating flexibility		≤3T		1T	passed
7.	coating adhesive		not lower than class 1		class 0	passed
8.	impact resistance		50Kg.cm no depainting,no crack		50Kg.m no depainting,no crack	passed
9.	boiling water resistance		no change		no change	passed
10.	acid resistance		no change		no change	passed
11.	alkaline resistance		no change		no change	passed
12.	oil resistance		no change		no change	passed
13.	solvent resistance		no change		no change	passed
14.	scrub resistance		no change when≥1000 times		no change when 10000 times	passed
15.	face density		specifide value ±0.5Kg/m²		3.61Kg/m²	passed
16.	bending strength		≥60MPa		68.3MPa	passed
17.	bending elastic modulus		≥1.5×104MPa		2.02×104MPa	passed
18.	penetration resistance		≥5.0KN		5.0KN	passed
19.	shearing strength		≥20.0MPa		20.4MPa	passed
20.	180° peel strength		≥5.0N/mm		6.3N/mm	passed
21.	temperature difference resistance		no change		no change	passed
22.	thermal expansion coefficient		4.00×10-5℃-1		5.7×10-6℃-1	passed
23.	heat distortion temperature		≥95℃		99℃	passed


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TEST REPORT

SEVEN

Product Application Projects



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QS-3101 Bright Silver

QS-3102 Sub Silver

QS-3104 Iron Grey

QS-3105 Champagne Golden

QS-3114 Cooper

QS-3117 Golden

QS-3118 Jade Silver

QS-2013 Pearl Orange

QS-3150 Champagne Gold Metallic

QS-3136 Pure Gold

QS-3179 Metallic Black

QS-3319 Metallic Blue

QS-3103 White

QS-3125 Milk White

QS-3153 Cream

QS-3112 Grey

QS-3115 China Grey

QS-7015 Grey RAL

QS-3111 Red

QS-3198 Magenta Red

QS-3113 Green

SEVEN

QS-3116 Dark Blue

QS-3108 Coffee

QS-3129 Dark Green

QS-3237 Signal Blue

QS-3123 Dark Yellow

QS-3181 Green Lime

QS-3126 Blue

QS-3110 Yellow

QS-3238 Signal Orange

QS-3109 Sea Blue

QS-3130 Black

QS-3135 Orange

QS-3176 White Glossy

QS-3177 Red Glossy

QS-3231 Yellow Glossy

QS-3235 Blue Glossy

QS-4218 Green Glossy

QS-3003 Ruby Red Glossy

QS-3383 Light Green Glossy

QS-3175 Brilliant Orange Glossy

QS-3178 Brown Glossy

SEVEN

QS-3236 Dark Blue Glossy

QS-3195 Light Almond Glossy

QS-3232 Signal Blue Glossy

QS-3242 Pink Rose Glossy

QS-3245 Light Blue Glossy

QS-3246 Black Glossy

QS-3006 Sparkling Purple

QS-3035 Sparkling Green

QS-3030 Sparkling Black

QS-3244 Sparkling Red

QS-3243 Sparking Violet

QS-3239 Sparkling Blue

QS-8008 Olive Brown

QS-1017 Saffron Yellow

QS-3183 Sparkling White

QS-3182 Metallic Grey

SEVEN



QS-5101 Horse Chestnut



QS-5102 Hazel Bright



QS-5103 Savin Golden



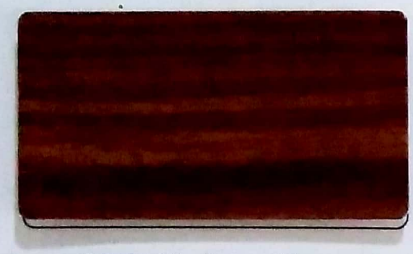
QS-5104 Alpine Maple



QS-5105 Mezereon Brown



QS-5106 Grape Rose



QS-5107 Cornel Tree



QS-5108 Stripe Daphine



QS-3301 Marble



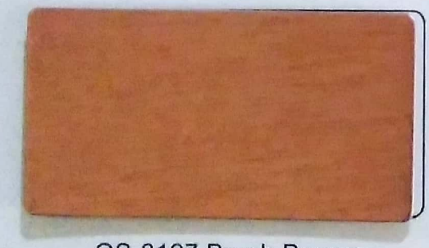
QS-3302 Giallo Granite



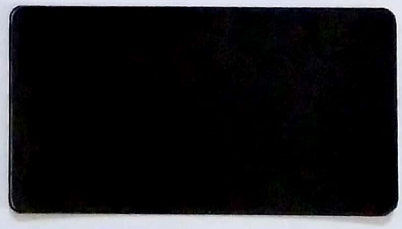
QS-3194 Brush Silver



QS-3196 Brush Gold



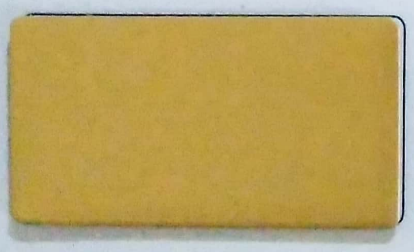
QS-3197 Brush Bronze



QS-3501 Red Chameleon

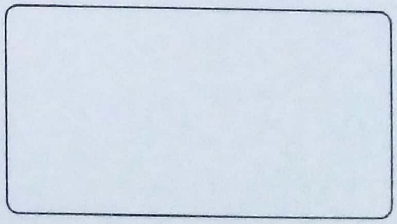


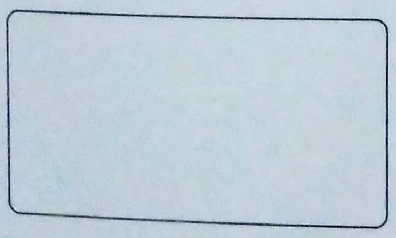
QS-3502 Silver Chameleon

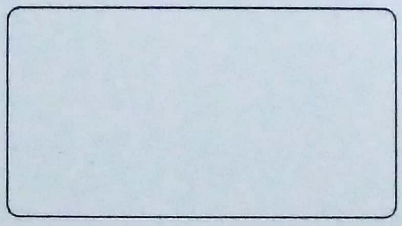


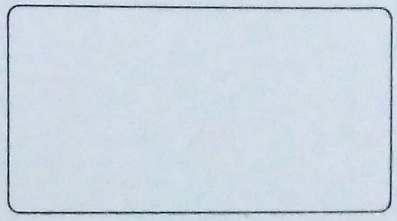
QS-3120 Gold Metallic











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Kpd Yth :
Pokja 4 Konstruksi dan KonsultasiUNDIP 2019
Gedung Widya PurayaLt 1 UNDIP

Dengan Hormat,
Yang bertanda tangan di bawah ini :
Nama : **Budi Prasetyo,S.T**
Jabatan : **Direktur**
Perusahaan : **CV HIDUP BARU SEJAHTERA**

Dengan ini kami memberikan dukungan ketersediaan material atap baja ringan **Merk TASO**
Kepada **CV D'JAYA SETIAWAN** untuk :
Pekerjaan Proyek Konstruksi Pembuatan JembatanPenghubung Gedung A dan Gedung Fakultas Hukun Universitas Diponegoro – Semarang Tahun Anggaran 2019.

Demikian surat dukungan ini dibuat agar dapat dipergunakan sebagaimana mestinya.

CV HIDUP BARU SEJAHTERA

HIDUP BARU SEJAHTERA
HBS

Budi Prasetyo,S.T
Direktur

Aksesoris

NOK RATU



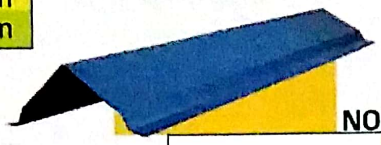
PJ. EFEKTIF	800 ± 10 mm
LEBAR KAKI	220 ± 10 mm
TINGGI	90 ± 5 mm

NOK RAJA



PJ. EFEKTIF	900 ± 10 mm
LEBAR KAKI	320 ± 10 mm
TINGGI	140 ± 5 mm

NOK SULTAN



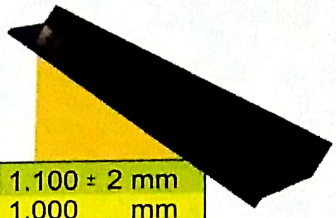
PANJANG	914 ± 2 mm
PJ. EFEKTIF	800 ± 2 mm
LEBAR KAKI MIRING	160 ± 2 mm
TINGGI	80 mm

NOK PUTRI



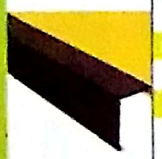
PJ. EFEKTIF	1.050 mm
LEBAR KAKI	120 ± 2 mm
TINGGI	80 ± 2 mm

NOK WF



PANJANG	1.100 ± 2 mm
PANJANG EFEKTIF	1.000 mm
LEBAR	95 ± 2 mm
TEKUKAN ATAS	65 ± 2 mm
TEKUKAN BAWAH	20 ± 2 mm
SUDUT TEKUKAN	140° ± 2°

NOK S



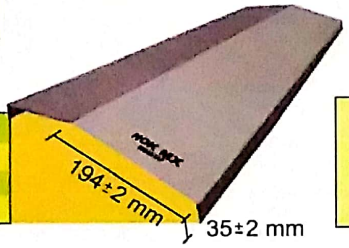
PANJANG	1.100 ± 2 mm
PJ. EFEKTIF	1.000 mm
LEBAR	80 ± 2 mm
TINGGI	100 ± 2 mm
KAIT ATAS/ BAWAH	22,5 ± 2 mm

NOK FANCY



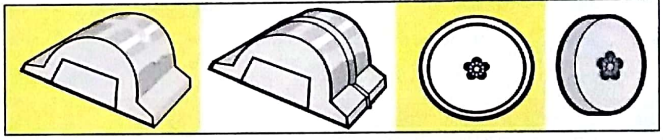
PANJANG	1.090 ± 2 mm
PJ. EFEKTIF	1.030 ± 2 mm
LEBAR	245 ± 2 mm
TINGGI	90 ± 2 mm

NOK MX



PANJANG	2.500 / 4.000 2 mm
PJ. EFEKTIF	2.400 / 3.900 ± 2 mm
LEBAR	365 ± 2 mm
TINGGI	100 ± 2 mm

TUTUP NOK



TASO®

KASO METAL

PAS TEBALNYA..PASTI KUAT!

TOP BRAND 2015-2018



TASO

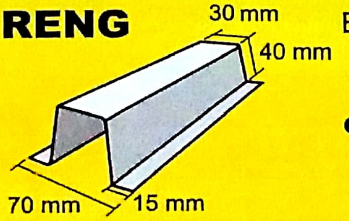
Bahan: Zinc Aluminium AZ 100 G550



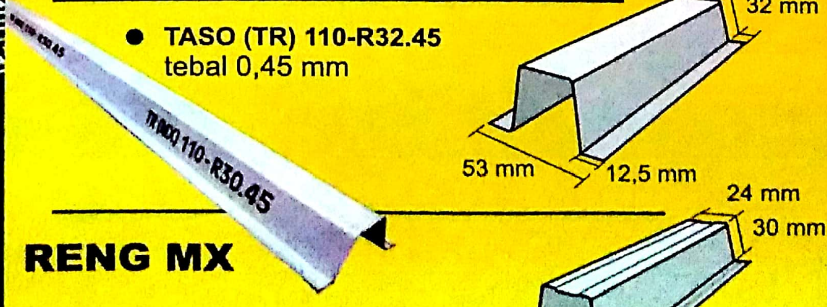
- **TASO (TS) 150-C75.65** tebal 0,65 mm (TCT)
- **TASO (TS) 150-C75.75** tebal 0,75 mm (TCT)
- **TASO (TS) 150-C75.80** tebal 0,80 mm (TCT)
- **TASO (TS) 150-C75.100** tebal 1,00 mm (TCT)

RENG

Bahan: Zinc Aluminium AZ 100 G550



- **TASO R.40.45**
  tebal 0,45 mm



- **TASO (TR) 110-R32.45**
  tebal 0,45 mm

RENG MX

- **TR (MX) 110-R30.45**
  tebal 0,45 mm

BRAKET L

bahan: Galvanis
tebal: 1,5 mm

SCREW TASO

Screw Truss 12 - 14 x 20
Screw Reng 10 - 16 x 16

TALANG JURAI DALAM

Bahan: Zinc Aluminium AZ 100



NIPPON PAINT



- **Cepat kering**
  Quick dry
- **Kilap tinggi**
  High gloss
- **Daya tutup baik**
  Good coverage
- **Anti-Pudar**
  Good colour-fastness

Bee Brand Junior 66

HIGH GLOSS SYNTHETIC ENAMEL



Cat Kayu & Besi

Bee Brand Junior 66

HIGH GLOSS SYNTHETIC ENAMEL

NP672 Rock Brown
NP641 Olympic Yellow
NP662 Cream Light
NP0604 Light Yellow
NP671 Beach Blue

NP657 Sepia Brown
NP627 Deep Buff
NP660 Natural Cream
114 Dakkar Yellow
NP619 Pacific Blue

NP620 Leaf Brown
NP625 Light Brown
NP606 Ivory White
NP680 Shine
NP678 Imperial

NP658 Teak Brown
NP633 Red Oxide
NP607 Pearl White
NP651 Canary Yellow
NP636 Violet

NP654 Walnut
NP656 Chestnut Brown
NP609 Milk cream
NP602 Golden Yellow
NP637 Pink

NP655 Saddle Brown
NP631 Coco Brown
NP601 Primrose
NP603 Nassau Orange
NP644 Red

NP630 Leather
NP663 Tudor Brown
NP608 Golden Cream
NP604 Orange
NP605 Vermillion

Hasil akhir warna yang ditampilkan dipengaruhi oleh spesifikasi layar monitor dan cahaya ruangan. Cahaya, bentuk dan permukaan yang dicat mempengaruhi hasil akhir.

NP649 Blue Bell
NP616 Jade Green
NP0605 Lime Green
NP664 Putih Kental Gloss
9102 Super White

NP618 Dresden Blue
NP617 Pelita Green
NP677 Garden Green
NP621 Setia Grey
NP659 Pink Kiss White

NP610 Bright Blue
NP613 Brilliant Green
NP612 Grasshopper Green
NP647 Stone Grey
9104 Silver Aluminium

NP653 Ocean Blue
NP652 Venetian Green
NP614 Traffic Green
NP623 Aircraft Grey
NP622 Grey

NP615 Azure Blue
NP639 Victoria
NP634 Bali Green
Juga tersedia warna : 9105 Clear
9103 Super Black

NP632 Drum Biru



Tersedia dalam kemasan:
- 0.94 liter
- 3.785 liter
- 20 liter
- 200 cc

NP66 Matt White
NP666 Matt Black

Tersedia juga Bee Brand Hammertone

606 Green Silver
601 Greenish Blue
605 Merah Bata
609 Orange
603 Silver

604 Tone Green
610 Super Blue
602 Tone Brown
607 Tone Black

Bee Brand Junior 66

HIGH GLOSS SYNTHETIC ENAMEL

Bee Brand Junior 66 adalah cat sintetis enamel berbahan dasar resin alkyd berkualitas tinggi dengan harga ekonomis. Memiliki keunggulan cepat kering, daya kilap tinggi, daya tutup baik, anti-pudar dan tahan terhadap cuaca. Keunggulan lainnya yaitu dapat dicuci serta mempunyai kelenturan dan kehalusan sangat baik. Mudah diaplikasikan pada berbagai substrat seperti struktur baja, kayu, mebel, besi, dll. Cocok untuk eksterior dan interior.

- **Cepat kering**
  Lebih cepat kering dalam 30 menit
- **Kilap tinggi**
  Hasil akhir sangat berkilau
- **Daya tutup baik**
  Daya tutup cat sangat baik
- **Anti-pudar**
  Tahan sinar matahari & warna lebih awet

Aplikasi Data

Pengenceran	: 0 - 20% Bee Brand 1000 Thinner.
Aplikasi	: Kuas, roll, atau spray.
Daya Sebar Teoritis	: 9 - 11 m²/liter/lapis.
Waktu Pengeringan	: Kering Sentuh : 30 - 60 menit.
	Kering Keras : 3 - 6 jam.
Interval Pengecatan Selanjutnya	: 16 jam.

OTHER PRODUCTS

interior & exterior



VINILEX
Cat tembok No. 1 dan terlaris di Indonesia. Tahan cuci dan disikat lebih dari 1,200 kali. Warna tahan lama. Bisa untuk interior dan eksterior.



NIPPON SPOT-LESS
Cat anti-noda yang memiliki daya tahan yang sangat baik terhadap kotoran dan noda cair sehingga tidak menempel di dinding. Bisa untuk eksterior dan tidak berbau.

interior



NIPPON FLAW-LESS
Cat interior premium dengan hasil akhir matt yang halus dan mewah, warna paling tahan lama, lebih tahan cuci, rendah VOC dan rendah bau.

exterior



NIPPON WEATHERBOND
Cat eksterior premium untuk cuaca ekstrim dengan formulasi Anti-Weather Technology dan Colour Protect. Anti-lumut dan jamur. Tahan lebih dari 5 tahun.

wall sealer



NIPPON 3-IN-1 ANTI-ALKALI PRIMER SEALER
Cat dasar water-based warna abu-abu dengan 3 kekuatan: meningkatkan daya tutup dengan sempurna, mencegah belang, anti-lumut dan jamur.

wall putty



MATEX PUTTY
Dempul No. 1 untuk menutup retakan dan meratakan permukaan tembok menjadi lebih halus dan rata.

spray paint



PYLOX
Cat semprot legendaris dengan Precision Nozzle Technology yang menghasilkan hasil semprotan yang sangat halus dan akurat. Tersedia dalam ratusan pilihan warna yang tahan lama, daya kilap tinggi dan cepat kering.

roof paint



MATEX CAT GENTENG
Cat genteng serba guna berkualitas tinggi yang tahan cuaca, daya lekat baik dan hasil yang halus. Bisa untuk dinding eksterior, taman, lapangan tenis, marka jalan, dan permukaan yang terpapar cuaca langsung.

auto refinish lacquer



NIPPE 2000
Cat lacquer auto refinish yang cepat kering, daya kilap tinggi dan tersedia dalam berbagai pilihan warna yang tahan lama. Bisa untuk kayu dan besi.

metal primer



NIPPON ZINC CHROMATE PRIMER
Cat sintetis enamel ekonomis untuk kayu & besi dengan kilap tinggi, cepat kering, daya tutup baik, anti-pudar dan mudah dibersihkan. Bisa untuk eksterior dan interior.

NIPPON PAINT

PT NIPSEA PAINT AND CHEMICALS
Jl Ancol Barat I/A5/C No. 12, Jakarta 14430, Indonesia
T: (021) 690 0546 F: (021) 692 7778
E: enquiry@nipponpaint-indonesia.com
www.nipponpaint-indonesia.com

Nama Toko & Alamat

ARCHITECTURAL HARDWARE

DEKSON®

QUALITY IS THE KEY



DEKSON
QUALITY IS THE KEY

TOP BRAND

3 year MECHANICAL WARRANTY

CARD LOCK HOTEL



CLH 2000MF



ENCODER MF CARD 2000MF



USB for SOFTWARE 2000MF



CONTACTLESS CARD CTC 2000MF
&
RECORD / INFORMATION CARD 2000MF



TERMINAL 3/1 2000MF



ES SWITCH MF 2000

CLH 1001 RF/TM



DATA RECORDER RF / TM



CONTACTLESS CARD RF/TM 1001

ENCODER RF/TM CARD READ & WRITE



SOFTWARE



READER

ER RF/TM (FOR 16 FLOORS)



READER

ER RF/TM (FOR 32 FLOORS)

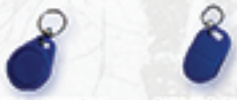


ES SWITCH RF809

CLH 900 ID



CTC FOR LKL 19 TM



CKH ID1 TRIANGLE

CKH ID2 OVAL



LKL 19 TM 01



SAFE BOX SB 420



ES SWITCH 808



DB 3 IN 1

HI-GRADE HINGE SUS 316

Material: Stainless Steel SUS 316

LIFETIME Warranty



NRP ESS 316
3X2.5X2.5MM 2BB SSS
Capacity (max) : 32,5 KG



NRP ESS 316
4X3X4 4BB SSS
Capacity (max) : 80 KG



NRP ESS 316
5X3X4MM 4BB SSS
Capacity (max) : 90 KG



NRP ESS 316
6X3.5X4 4BB SSS
Capacity (max) : 100 KG



NRP ESS 316
8X4X4MM 6BB SSS
Capacity (max) : 120 KG

DELUXE HINGE

Material: Stainless Steel SUS 304



ESS DL
3X2.5X2MM 2BB SSS
Available:
3X2.5X2MM SSS
Capacity (max) : 30 KG



ESS DL
4X3X2MM 2BB SSS
Available:
4X3X2MM SSS
Capacity (max) : 40 KG



ESS DL
4X3X3MM 2BB SSS
Capacity (max) : 75 KG



ESS DL
4X4X3MM 2BB SSS
Capacity (max) : 75 KG



ESS DL
5X3X3MM 4BB SSS
Capacity (max) : 80 KG

NRP HINGE

Material: Stainless Steel SUS 304



NRP ESS DL
3X2.5X2.5MM 2BB SSS
Available:
3X2.5X3.5MM 2BB SSS
Capacity (max) : 32,5 KG



NRP ESS DL
4X3X3MM 4BB SSS
Capacity (max) : 75 KG
Available:
4X3X4MM 4BB SSS
Capacity (max) : 80 KG



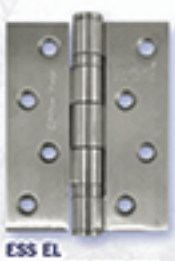
NRP ESS DL
5X3X3MM 4BB SSS
Capacity (max) : 80 KG
Available:
5X3X4MM 4BB SSS
Capacity (max) : 90 KG
6X3.5X3MM 4BB SSS
Capacity (max): 90 KG

ECOLINE HINGE

Material: Stainless Steel



ESS EL
3X2.5X2MM 2BB SSS
Available :
3X2.5X2MM SSS
3X2.5X2MM 2BB TP
Capacity (max) : 30 KG



ESS EL
4X3X2MM 2BB SSS
Capacity (max) : 40 KG
Available :
4X3X2MM SSS
Capacity (max) : 40 KG
4X3X3MM 2BB SSS
Capacity (max) : 75 KG
4X3X3MM 4BB SSS
Capacity (max): 75 KG
4X3X3MM 4BB TP
Capacity (max): 75 KG



ESS EL
5X3X3MM 4BB SSS
Capacity (max) : 80 KG
Available :
5X3X3MM 4BB TP
Capacity (max): 80 KG

DEKSON
QUALITY IS THE KEY
TOP BRAND

IRON HINGE

Material: Iron



ES IR
3X2.5X2.5MM 2BB GP
Available : SN, CP
Capacity (max): 37,5 KG



ES IR
4X3X3MM 4BB CP
Available : SN, GP
Capacity (max) : 75 KG



ES IR
5X3X3MM 4BB SN
Available : CP, GP
Capacity (max) : 80 KG

NYLON IRON HINGE

Material: Iron



NYLON ES IR
3X2.5X2MM 4NR NA
Available : BA, WH
Capacity (max): 30 KG



NYLON ES IR
4X3X2MM 4NR BA
Available : NA, WH
Capacity (max) : 40 KG

SPECIAL PURPOSE HINGE



ESS SGH
4X3X3MM 2BB SSS
Capacity (max): 75 KG



ESS SPR
4X3X3MM SSS
Available :
4X4X3MM SSS
Capacity (max): 30 KG



ESS EL "H"
4X3X2MM 2BB SSS
Capacity (max) : 30 KG



ESS
50X40X1.5MM 2NR SSS
Capacity (max): 15 KG



ESS
63X40X1.5MM 4NR SSS
Capacity (max): 20 KG



ES AL
2005 4X3.5X3MM NA
Available : BK, WH, YBIC
Capacity (max) : 40 KG



ESS FH
127X63X3MM 1W SSS
Capacity (max): 50 KG



ESS LOH
4X3X2MM SSS
Capacity (max): 30 KG



ES SL (Salon)
5" CP
Available :
9" CP
SUS 304 5" SSS
SUS 304 9" SSS



ES SD (Sendok)
B SERIES CP
(With Hydraulic Closer)



ESS PV 001 SSS
Capacity (max) : 50 KG



ESS PV 002 SSS
Capacity (max) : 250 KG



FPB DL 05
Capacity (max) : 200 KG

* acc FH Stoving and Top Pivot to be ordered separately

PULL HANDLE

FOR GLASS & WOODEN DOOR



PH DL801
32X600 PSS
Available in :
25X200 PSS, 32X300 PSS
32X350 PSS, 32X400 PSS
32X450 PSS, 32X500 PSS
PH EL801 25X200 PSS
PH EL801 32X300 PSS
PH EL801 32X350 PSS
PH EL801 32X450 PSS
PH EL801 32X500 PSS
PH EL801 32X600 PSS



PH SQ DL801
30X15X350 SSS
Available in :
30X15X450 SSS
30X15X600 SSS



PH DL802
32X457X300 PSS+SSS
Available in :
25X400X300 PSS+SSS
25X425X285 PSS+SSS
25X457X300 PSS+SSS
32X500X300 PSS, PSS+SSS
32X600X400 SSS, PSS, PSS+SSS
32X800X600 PSS+SSS
38X1000 SSS, PSS, PSS+SSS
38X1200 SSS, PSS, PSS+SSS
38X1600 PSS, SSS
38X2000 PSS
PH EL802 32X457X300 PSS+SSS
PH EL802 32X500X300 PSS+SSS
PH EL802 32X600X400 PSS+SSS



PH BS 215 SSS



PH SQ DL802
30X15X600 SSS
Available in :
30X15X450 SSS, PSS
30X15X600 PSS



PH802 OVAL
30X20X600 SSS



PH DH809
30X15X600 SSS
Available in :
30X15X800 PSS+SSS
30X15X800 PSS



PH DL809
32X350 PSS
Available in :
32X300 PSS, SSS
32X350 SSS
PH EL809 32X300 PSS
PH EL809 32X350 PSS



PH 816
30X15X600 SSS
Available in :
30X15X600 PSS



PH DL815
20X40X600 SSS
Available in :
20X40X600 PSS
25X19X300 SSS



PH D441
20X38X600X425 SSS+PSS
Available in :
20X38X800X625 PSS+SSS



PH DL804
32X300 PSS



PH DL1868
40X25X600 PSS+SSS
Available in :
40X25X1200 PSS+SSS



PH 146
25X432X500 PSS+SSS
Available in :
25X232X300 PSS+SSS



PH DL1844
32X15X500 PSS+SSS



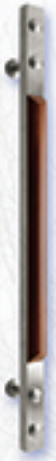
PH DL1831
32X500 PSS+SSS
Available in :
25X500 PSS+SSS



SPH 0819 SSS
Available in :
TPH 819 300MM SSS
TPH 819 19X400MM SSS
TPH 819 25X400MM SSS



TPH 981
38X630X600MM PSS+SSS
Available in :
35X450X400MM PSS+SSS



PH D268
20X40X800X60 SSS+WOOD



PH D351
30X600X570 SSS+WOOD
Available in :
25X400X375 SSS
25X400X375 SSS+WOOD



PH 1880 SSS



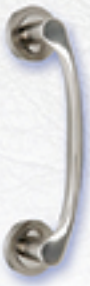
PH 1881 SSS

AVAILABLE IN MANY CHOICE OF DIFFERENT DESIGN, TYPE AND COLOR

FOR WOODEN DOOR



PHR SQ 801
30X15X350 SSS



PH D001Z SN



SPH 0820 SSS



PH AP25801A SN
Available in :
PH AP25801A MAB



PH AP25570 SN+NP



PH AP25929 SN+CP



SPH 0821 SSS
Available in :
SPH 0821 PVD



PH AP25140 GP+SGP
Available in :
PH AP25140 SN+NP



PH AP25919 SN+NP

Untuk type PULL HANDLE DELUXE (PH DL) ketebalan plat adalah 1,2 mm

LEVER HANDLE SOLID ROSES (LHSR)

Material: Stainless Steel SUS 304


LHSR 0011 SSS


LHSR 0016 22MM SSS


LHSR 0034 SSS


LHSR 0039 SSS


LHSR 0049 SSS


LHSR 0049 OVAL SSS


LHSR 0040 SSS


LHSR 0051 SSS + PSS


LHSR 0056 SSS


LHSR 0058 SSS


LHSR 0061 SSS


LHSR 0085 SSS


LHSR 0132 SSS


LHSR 0137 SSS + PSS
Available : SSS


LHSR 0138 SSS


LHSR 0139 SSS


LHSR 0142 SSS


LHSR 0309 SSS


LHSR 0406 SSS
Available: PSS


LHSR 0506 SSS


LHSR 0238 SSS



LEVER HANDLE TUBE ROSES (LHTR)

Material: Stainless Steel SUS 304


LHTR 0113 SSS


LHTR 0003 SSS


LHTR 0015 SSS


LHTR 0016 19MM SSS


LHTR 0016 22 MM SSS


LHTR 0017 SSS


LHTR 0017 OVAL SSS


LHTR 0018 SSS


LHTR 0019 SSS + PSS


LHTR 0035 SSS


LHTR 0039 SQ SSS


LHTR 0039 SSS


LHTR 0039 OVAL SSS


LHTR 0041 SSS


LHTR 0043 SSS


LHTR 0044 SSS


LHTR 0051 SSS + PSS


LHTR 0056 SSS

LHTR 0058 SSS

LHTR 0085 SSS

LHTR 0101 SQ SSS

LHTR 0102 SQ SSS


LHTR 0103 SQ SSS + PSS


LHTR 0104 SSS


LHTR 0105 SSS + PSS


LHTR 0108 SQ SSS + PSS


LHTR 0110 SSS


LHTR 0142 SSS


LHTR 0146 SSS


LHTR 0218 SSS + CP


LHTR 0222 SQ SSS


LHTR 0803 SSS


LHTR 0805 SSS


LHTR 0819 SSS


LHTR 0820 SSS


LHTR 0820 OVAL SSS


LHTR 0821 SSS


LHTR 0822 LSQ SSS


LHTR 0822 SSS


LHTR 0823 SSS


LHTR 0824 SSS


LHTR 0825 SSS


LHTR 0826 SSS


LHTR 0828 SSS


LHTR 84030 OVAL SSS



LEVER HANDLE ROSES (LHR)




LHR 2668 SN + NP


LHR 0816 NA
Available : BK, WH, YB1C


LHR 1041 SN + NP


LHR 2001 AZ ZN+NP


LHR 2007 SN + NP


LHR 2009 AZ SN + NP


LHR 2017 AZ SN + NP


LHR 2022 SN + NP


LHR 2028 AZ SN + NP


LHR 2030 AZ SN + NP


LHR 2035 SN


LHR 2048 SN


LHR 2049 SN + NP


LHR 2068 AZ SN + NP
Available : SG + GP


LHR 2073 SN + NP

LHR 2095 GP + SGP
Available : SN + NP

LHR 2099 SN + NP

LHR 2110 SN + NP

LHR 2115 SN

LHR 2192 SN + CP
Available : BSG + GP

LHR 2213 CP

LHR 2216 SN + CP
Available : BSG + GP


LHR 2217 SN + CP


LHR 2223 SN + NP
Available : GP + BSG


LHR 2232 CP


LHR 2237 BSG + GP
Available : SN + NP


LHR 2238 GP + BSG
Available : SN + NP


LHR 2257 SN + NP
Available : GP + BSG


LHR 2282 CP


LHR 2285 BSG + GP
Available : SN + CP


LHR 2287 SN


LHR 2291 SN + NP
Available : BSG + GP


LHR 2293 CP


LHR 2295 SN + CP


LHR 2688 SN + NP


LHR 2897 SN + NP


LHR 2956 SN


LHR 2967 SN


LHR 2983 SN + NP


LHR 5208 SN + CP


LHR 5028 AZ SN + NP


LHR 5061 SN + NP


LHR 5218 SN + NP


LHR 5230 SC + CP


LHR 5830 SN+NP


LHR 5895 SN+NP


LHR 7580 CF


LHR 8267 MAB


LHR 8288 MAB


LHR 8536 CF


LHR 9219 SN + CP


LHR 9568 SN + CP


LHR 9818 MAB


LHR 9889 SN + NP


LHR 9891 SN + NP


LHR 9908 SN + NP


LHR 9911 SN + NP


LHR 9961 SN + NP


LHR 9962 SN + NP


LHR 9986 SC + CP


LHR 9991 CP


LHR 10632 MAB

LHR 10681 MAB

LHR 10693 CF

LHR 21037 CP

LHR 22885 MAB

LHR 81033 MAB

LEVER HANDLE PLATE (LHP)



LHP 1557 SN + NP
Available : AB, GP + SG



LHP 1712 Al SN + NP



LHP 1949 AB
Available : SN, GP



LHP 2009 AZ SN + NP
Available : GP + SG



LHP 2028 AZ SN + NP



LHP 2076 Al SN + NP



LHP 2095 GP + SG
Available : AB, SN + NP



LHP 2208 SN + NP



LHP 2228 AZ SN + NP



LHP 2368 AZ SN + NP



LHP 7662 SN + NP



LHP 11692 CF



LHP 81430 BK
Available : NA, WH, YB1C



LHP 95580 CF



LHP 96536 CF



LHP OVAL T003 SSS



LHP T005 PVD
Available : SSS



LHP SQ T016
19MM SSS



LHP OVAL T016
19 MM SSS



LHP T039 SQ SSS



LHP T104 SQ SSS



LHP T519 SSS + PSS



LHP T822 SQ SSS

PULL PLATE



PP 004 AB
Available :
PVD, SSS



PP 009 SSS



PP 012 SSS
Available :
PVD, AB, PSS



PP 013 PVD
Available :
SSS, AB, PSS

SIGN PLATE



SP002D CYL SSS



SP002A SSS
Available : PVD



SP002A PUSH PVD
Available : SSS



SP003 HDL
+ CYL HOLE SSS



SP003 HDL SSS
Available : PVD



SP003
HDL PULL PVD
Available : SSS

ESCUTCHEON



ESCN
855 SSS/PSS



ESCN
855 AB



ESCN
855 PVD



ESCN
D01 SSS



ESCN
D13 SSS



ESCN
84030 SN



ESCN
SQ01 SSS



ESCN
SQ13 SSS

MORTISE

SWING / INTER LATCH

LIFETIME Warranty for MECHANICAL



MTS IL DL
84030 SSS



MTS IL DL
8485 PVD
Available : SSS



MTS IL DL
8585 SSS
Available : AB, RAB



MTS IL DL
8685 SSS
Available : PVD

ROLLER LATCH



MTS RL DL
84030 SSS



MTS RL DL
8485 PVD
Available : SSS



MTS RL DL
8585 SSS
Available : AB, RAB



MTS RL DL
8685 SSS
Available : PVD

MULTI POINT LOCK



MPL
8685 1600MM SSS

SLIDING



MTS SLD DL
83100 SSS



MTS SLD DL
84100 SSS



MTS SLD DL
85100 SSS



MTS SLD
8225 SSS

HEAVY DUTY



MTS HD
DL8672 PANIC SSS
Available :
DL8672 NON PANIC SSS

HEAVY DUTY HI-GRADE

Material : Stainless Steel SUS 316

HIGH GRADE!

HEAVY DUTY

LIFETIME Warranty for MECHANICAL



MTS IL
8585 SSS

MTS RL
8585 SSS

CYLINDER

LIFETIME Warranty for MECHANICAL



CYL HC DL
50mm SN
Available : 40mm



CYL DC DL
60mm SN / PB
Available :
50mm, 65mm,
70mm, 80mm



CYL DC KK DL
60mm SN / PB
Available : 70mm



CYL TC DL
60mm SN / PB
Available : 65mm,
70mm



CYL BK DL
60mm SN / PB



TC KK DL
60mm SN
Available : 70mm

ENTRANCE HANDLE

5 year MECHANICAL GUARANTEE LOCKCASE & CYLINDER



EHDL D8002
ODD SSS
Available : PVD



EHDL D8003
ODD PVD
Available : SSS, AB



EHDL D8004
DOUBLE SSS
Available :
Double PVD



EHDL
D8102 AC



EHDL
D8102 SN



EHDL
D8103 AC



EHDL
D8103 SN

LOCKSET SERIES

5 year MECHANICAL GUARANTEE LOCKCASE & CYLINDER



KCBL T9587 BK SSS
(Tubular)



KCBL T9587 ET SSS
(Tubular)



KCBL 8587 ET SSS
(Cylinderical)



KCBL 8587 BK SSS
(for toilet)



KCBL HD8000 ET SSS
(Cylinderical)



KCBL 8731 SSS + PSS
(Cylinderical)
Available : SB + PB



DL 901 DC SSS
(Dead Lock)
Available : PB



DL 901 TC SSS
(Dead Lock)
Available : PB



DL 901 TS PB
(Dead Lock)
Available : SSS



LS T6200 BK SSS
(Leverset)



LS T6200 ET SSS
(Leverset)
Available : PB, AB



LS T6300 BK SSS
(Leverset)



LS T6300 ET SSS
(Leverset)
Available : PB, AB

DOOR CLOSER



DCL 300 NHO BA
Available : NA, WH
Capacity (max) : 40 kg

3 year MECHANICAL WARRANTY



DCL 529 NHO NA
Available : BA
Capacity (max) : 40-80 kg



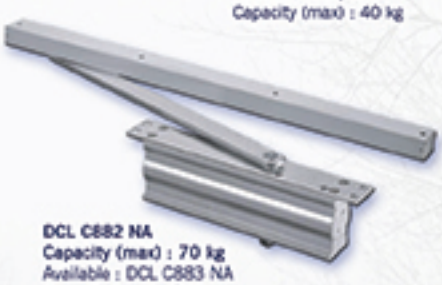
DCL 300 HO BA
Available : NA, WH
Capacity (max) : 40 kg



DCL 105 NHO BA
Available : NA
Capacity (max) : 100 kg



DCL 529 HO BA
Available : NA
Capacity (max) : 40-80 kg



DCL C882 NA
Capacity (max) : 70 kg
Available : DCL C883 NA
Capacity (max) : 50 kg



DCL 522 NA
Available : BA
Capacity (max) : 60 kg



DCL 529 SLD BA
Available : NA
Capacity (max) : 40-80 kg

FLOOR HINGE



FH 84 SSS

PSB SINGAPORE

3 year MECHANICAL WARRANTY

Type	Size	Capacity (Max.)	Door Width
FH 211 SSS	-	60 kg	800 mm
FH 84 SSS	Normal	80 kg	900 mm
FH 84 SSS	4	100 kg	1100 mm
FH 75 SSS	-	130 kg	1200 mm
FH 80 SSS	-	300 kg	1500 mm



FH 75 SSS



FH 80 SSS



FH 211 SSS

PATCH FITTING


US 10 PSS


PT 10 PSS


PT 20 PSS


PT 24 PSS


PT 30 PSS


PT 40 PSS

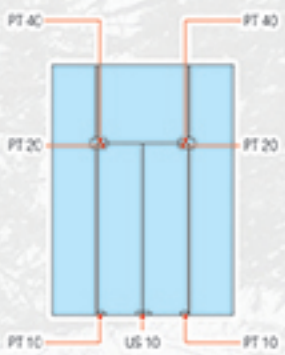

PT 41 PSS
Available : L/H, R/H

NEW TECHNOLOGY
HYDRAULIC PATCH FITTING


PTH 1000 PSS
Available : PTH 100 PSS

3 YEAR WARRANTY

PSB APPROVED



SHOWER HINGE

GLASS to WALL		GLASS to GLASS (180°)	GLASS to GLASS (90°)	GLASS to GLASS (135°)	GLASS to FLOOR
					
 SH 8600B (GW) CP	 SH 8601B (GW) CP				 ASH 8500 CR (GW) CP
 ASH 8600G (GW) CP	 ASH 8601G (GW) CP	 ASH 8603G (180) CP	 ASH 8604G (90) CP		 SH 8331 CP
 ASH 8701 CR (GW) CP		 ASH 8703 CR (180) CP	 ASH 8704 CR (90) CP	 ASH 8705 CR (135) CP	
 SH 5501 (GW) SSS		 SH 5503 (GG) 180 SSS			
 SH 7701 (GW) CP	 SH 7702 (GW) CP	 SH 7703 (180) CP	 SH 7704 (90) CP	 SH 7705 (135) CP	
 SH 9301 (GW) CP		 SH 9303 (180) CP			
 SH 9901 (GW) CP		 SH 9903 (180) CP		 SH 9905 (135) CP	
 SH MF8201 SSS		 SH MF8203 SSS			

NEW TECHNOLOGY
HYDRAULIC SHOWER HINGE

SHH 9801
(GLASS to WALL)

SHH 9803
(GLASS to GLASS 180°)

SLIDING SHOWER

SD 001 COMP + TRACK



TOP TRACK



FLOOR GUIDE



ROLLER STOPPER



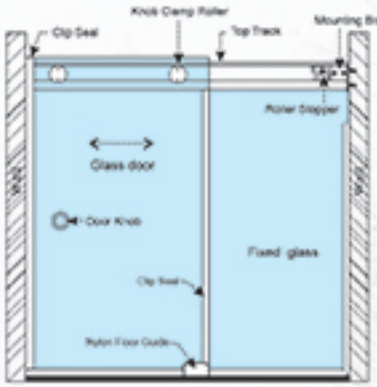
DOOR KNOB



KNOB CLAMP ROLLER



MOUNTING BRACKET



Capacity (max) : 50 kg
Glass Thickness : 8-10 mm
Height (max) : 200 mm

DELUXE SLIDING MAGTEC SET



STOPPER



TUBE GLASS CONNECTOR



ROLLER FOR TUBE



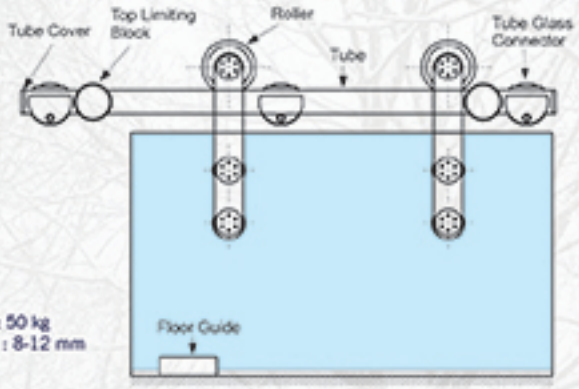
TUBE 3M
*to be ordered separatedly



FLOOR GUIDE



ACC TUBE DOP



Capacity (max) : 50 kg
Glass Thickness : 8-12 mm

SLIDING GLASS DOOR



L4
(SGD ACC L4 8111A SET)
Capacity (max) : 80 kg



S6
(SGD ACC 8922-63 COMPLETE SET)
Capacity (max) : 120 kg



L6
(SGD ACC 8922-57 COMPLETE SET)
Capacity (max) : 150 kg

SLIDE & FOLD GLASS DOOR



FGD 802T



FGD 804T



FGD 807T



FGD 808T



FGD 803T



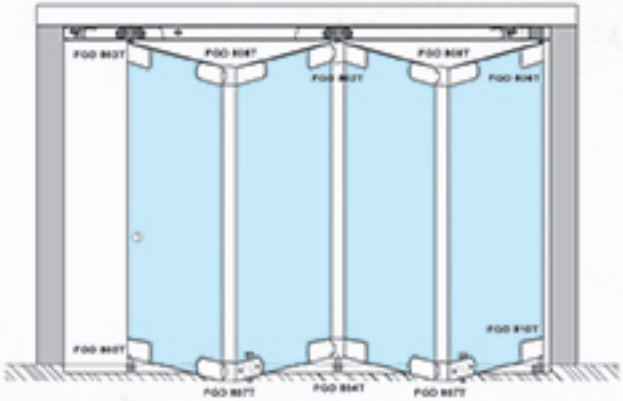
FGD 805T



FGD 806T



FGD 810T



SPIDER FITTING


SF 8211 160MM SSS


SF 8213 160MM SSS


SF 8212 160MM SSS


SF 8214 160MM SSS


SF 8241 160MM (ROUTEL) SSS


SF 8245 160MM (BASE) SSS

Capacity (max) :
170 kg / lembar kaca


SF 8111A 220MM SSS


SF 8112A 220MM SSS


SF 8141 SSS 220MM (ROUTEL)


SF 8111 220MM SSS


SF 8112 220MM SSS


SF 8145 SSS 220MM (BASE)


SF 8113 220MM SSS


SF 8114 220MM SSS

Capacity (max) :
220 kg / lembar kaca

PIVOT FITTING


PD 8100F SSS

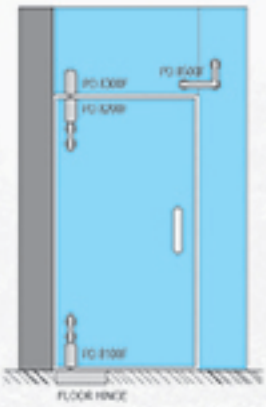

PD 8200F SSS


PD 8300F SSS


PD 8500F SSS


PD 8400F SSS


PD 8700F SSS



ACCESSORIES FOR GLASS

DOOR KNOB


DK 82801 CP


DK 82804 CP


DK 001 ROUND SSS


DK 82803 CP


DK 82807 CP

GLASS LOCK


GDL 8010 GW SSS


GDL 8010D GW SSS


GDL 8011 GG SSS


SGL 8600 SUS 304 (GW) SSS


SGL 8601 SUS 304 (GG) SSS


GL 622 CP


GL 622-1 CP


GL 8600 CP


GL 8601 CP KEEPER


GDL 38255 PSS



GDL 38225A SSS



GDL 38231 PSS



IL 8600C CP



IL 8700C CP



IL 8701C CP

ACCESSORIES FOR GLASS



ADV 19X30 MM SSS
Available :
19 X 40MM
19 X 50MM
19 X 60MM
19 X 70MM



ADV 25X30 MM SSS
Available :
25 X 40MM
25 X 50MM
25 X 60MM
25 X 70MM



ADV 30X30 MM SSS
Available :
30 X 40MM
30 X 50MM
30 X 60MM
30 X 70MM



ADV G01 32X10 MM SSS
Available :
32 X 20MM
32 X 30MM
32 X 40MM
32 X 50MM



GH 19-01 CP



GH 19-02 CP



GC 018 (GW) PSS



GC 018 (GG) PSS



GC ART00016 (GG) CP



GC 832 CP



GC 833 CP



GC U8541 PSS



GC 801052F SSS



GC 802052F SSS



GC 803075F SSS



GC 804140F SSS



GC Z-15G CP



GC BL002 SN



GC BL003 SN



GL D009 SN



KT SOLID 304
(160MM) SSS



KT 001
(8-10MM) SSS
Available : PSS



CS 8907
Available :
10 x 2.2M (180) WH
12 x 2.2M (180) WH



CS 8908
Available :
10 x 2.2M (135) WH
12 x 2.2M (135) WH



CS 8909
Available :
10 x 2.2M (90) WH
12 x 2.2M (90) WH



CS 8910
Available :
10 x 2.2M OVAL
12 x 2.2M OVAL



CS BS 2.2M



CS SS 2.2M



CS OW 2.2M



CSB 001
Available :
10 x 2.2M
12 x 2.2M

SILICONE



SILICONE DKS NEUTRAL NA
Available : NA, BL, DB, WH, LIGHT GREY
SAUSAGE PACKAGE 600ML



SILICONE DKS ACETIC SEALANT 100% NA
Available : NA, BK, BA, WH, LIGHT GREY



SILICONE DKS ACETIC SEALANT (EXTENDED)
Available : NA, BK, BA, WH, LIGHT GREY



SILICONE DKS CONSTRUCTION ADHESIVE
Available : CLEAR



SILICONE DKS ACRYLIC SEALANT
Available : WHITE



SILICONE DKS HMP-901 MS POLYMER ADHESIVE SEALANT
Available : WH, BK, GREY

SILICONE GUN



SILICONE GUN DEKKSON 8200



SILICONE GUN DEKKSON 8600

GLASS SUCTION



GSC 3S

FRICTION STAY

TOP HUNG & SIDE HUNG - Stainless Steel SUS 304



FS S/S
Available : 8", 10", 12", 14", 16"



FS S/S
Available : 20", 24"



FS S/S
Available : 28", 36"

Available in IRON material : 8", 10", 12", 14", 16", 20", 24"

HEAVY DUTY TOP HUNG - Stainless Steel SUS 304



FS HD T250 20"



FS HD T250 28"

Available in STAINLESS STELL SUS 316 material for FS HD T250 : 12", 16", 20", 28"

HEAVY DUTY SIDE HUNG - Stainless Steel SUS 304



FS HD S250 10"



FS HD S250 12"



FS HD S250 16"



FS HD S250 22"

Available in STAINLESS STELL SUS 316 material for FS HD S250 : 12", 16", 22"

ARMSTAY



AR 12"
Available in : 6"

DELUXE HEAVY DUTY SIDE HUNG - Stainless Steel SUS 304



DELUXE FS HD S250 10"



DELUXE FS HD S250 12"



DELUXE FS HD S250 16"



DELUXE FS HD S250 22"



CASEMENT HANDLE

Available in : BK (Black), NA (Silver), YB1C (brown), WH (White)



CH 400



CH 407
L/H or R/H



CH 420
L/H or R/H



CH 423
L/H or R/H



CH 425
L/H or R/H



CH 428
L/H or R/H



CH 429 LOCK
L/H or R/H



CH 429 N-LOCK
L/H or R/H



CHW 4
L/H or R/H

ACCESSORIES FOR ALUMINIUM

CRESCENT LOCK

Available for Left (L) & Right (R)



CL 310 BK
L/H or R/H
Available :
BK, BA, NA, YB1C



CL 320 NA
L/H or R/H
Available :
BK, BA, NA, YB1C

ROLLER



RSD BESAR



RSD 001 HD



SCR 001 BIG CP



RSD BESAR HD



RSW KECIL



SCR 001 SMALL CP

PROTECTION TAPE & FLUSH BOLT



FB 508 NA
Available : BK, WH, YB1C



PTT 200x1220MM
BLUE



PTT ECO 100M
BK / WH

ALUMINIUM LOCK



KC 909 BA
Available :
KC 909 IVORY



KC 8203 BA
Available :
BK, WH



KC 8123
Available :
KC T8123 (Thumbturn)



KC 8128
Available :
KC 8128 (PJ)
KC 8128 (PD)
KC T8128



KC 8423
Available :
KC T8423 (Thumbturn)



KC 88130 (PD)



KS RA6 (NA)
Available : BK, BA, WH

ESPAGNOLETTE



EPL AL 828A
600mm+HDL
BK, WH, YB1C
Available :
1000mm + HDL
BK, WH, YB1C
1500mm + HDL
BK, WH, YB1C

MOHAIR



MOHAIR SIL
0,48X0,9X250M
Available :
0,69X0,9X25CM
COLOR : BLACK



MOHAIR KECIL
0,69X0,5X200M
COLOR : GREY



MOHAIR BESAR
1,1X0,7X175M
COLOR : BLACK,
BROWN, GREY

DOOR SEAL



ZS A802 NA



"D" PROFIL DSD 9X6mm WH
Available : BROWN



DOS1 NA
AUTOMATIC

ACCESSORIES FOR WOOD



DS 001 SSS



DS 002 SSS



DS 006 SSS



DS 007 SN
Available in : PVD



DS 009 SSS



DS 825 SN
Available : PB



DS 886 SN
Available : GP



DS 887 SN
Available : GP



MDS 001 IVORY
Available : BROWN



MDS 047BR PB
Available : SN



MDS 220 SN



MDS 889 GP
Available : SN



DB SQ 2" SSS
DB SQ 3" SSS



DB 002 3" SSS
Available :
2" SSS



WB 001 SSS
WB 001 50MM SSS



WB with KEY SSS



DC 005 SSS



DC 010 SN
Available : PB



DG 020 SN
Available : PB



DG 81005 SN



DP 003 SSS
Available :PVD

ESPAGNOLETTE



EPL DEKKSON
Available :
640mm SSS
1000mm SSS
1600mm SSS
2000mm SSS

EPL COTS
Available :
640mm SN
1000mm SN
1600mm SN
2000mm SN



FB 040 8" + 12" SSS
Available :
8" + 18" SSS
8" + 24" SSS
8" + 40" SSS



FB 050 8" + 12" SSS
Available :
8" + 18" SSS
8" + 24" SSS



FB 608 6" + 12" SN, PB, AB
Available :
6" + 18" SN, PB, AB
6" + 24" SN, PB, AB
6" + 36" SN, PB, AB



FBP 2.5" SSS
Available :
6" SSS



FBP 8" SSS
Available :
12" SSS



KLV 021LI SSS



EC 003 PB



RC 221 CP



SK 018 BR SN
Available : PB, AB



CLW COTS 510 Z SN



SK 028 SQ SN
Available : PB



WH 010 SSS
Available : AB



WS 001 8" SSS
Available : 10" SSS



WS 011Z 8" SN



WR BR SQ01 8" SN, PB
Available : 10" SN, PB



AWH 001 BR PB
Available : SN



AWH SQ 001 SSS



CWH 103 Z SN
Available : 103 SSS



CWH 104 SQ PB
Available : SN



CWH 105 SQ SN
Available : PB



DV 200 CP
Available : SN, PB

DIGITAL DOOR VIEWER



DV 827 CAM BK



DV 837 CAM RECORDER BK

SLIDING RAIL FOR ALUMINIUM, WOODEN, STEEL DOOR

SR 8901 D3

Type	Track	Capacity (Max.)
D3	1800 mm	45 kg



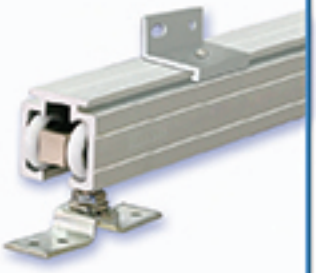
SR 8901 D4
Available : D5

Type	Track	Capacity (Max.)
D4	2000 mm	100 kg
D5	2400 mm	100 kg



SR 8901 D6

Type	Track	Capacity (Max.)
D6	3000 mm	150 kg



FURNITURE HANDLE



FH D800
Available :
10x100-250
12x120-500



BASE PLAT BP D800 SSS



FH 002 SSS



FFH 003 SSS

PADLOCK



PL 811 46MM



PL 811 56MM



PL 100 20MM CP
Available :
40MM CP, 50MM CP, 60MM CP



PL 811 46MM SP



PL 811 56MM SP



PL 200 40MM L SN
Available :
40MM S SN, 50MM L SN
50MM S SN, 60MM L SN
60MM S SN

HARDWARE FOR STEEL DOOR

STEEL DOOR 8672 NON PANIC HANDLE DOUBLE ENTRY



① MTS IL 8672 SSS
② HINGE 4X3X3MM-2BB
③ CYL DC 80MM SN
④ LHSR 016/22 MM+ESCUTCHEON

STEEL DOOR 8672 PANIC HANDLE DOUBLE ENTRY



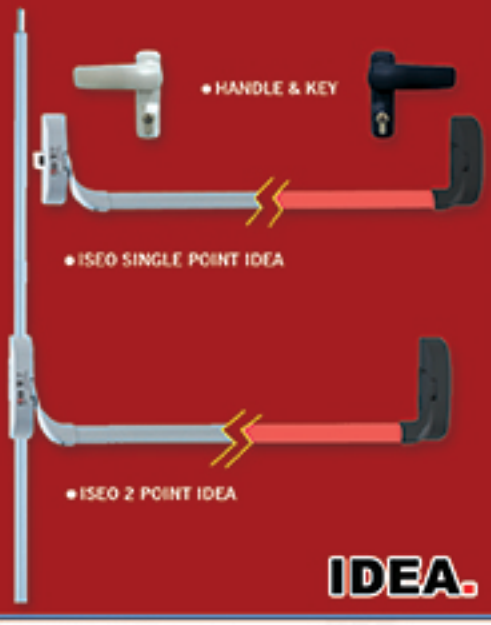
① MTS IL 8672 PANIC SSS
② HINGE 4X3X3MM-2BB
③ CYL DC 80MM SN
④ LHSR 016/22 MM+ESCUTCHEON

STEEL DOOR 8672 PANIC KNOB SINGLE ENTRY



① MTS IL 8672 PANIC SSS
② HINGE 4X3X3MM-2BB
③ CYL HC 50MM SN
④ LHSR 016/22 MM+KNOB
⑤ ESCUTCHEON ESCN 855 SSS

PANIC BAR FOR STEEL DOOR



ISEO
Made in Italy



CLOSED-CASE MORTISE LOCK



CYLINDER F6-DC80



ISEO PALMO 949000050379

SHAFT DOOR



ACCESSORIES



DCL 105 NHO NA



FB SQ 501
270MM

FB SQ 501
370MM



FLS-DKS-02-MMXV-VIII-B2

Catylac by Dulux



Catylac by Dulux

Keunggulan :

1. Catylac dari Dulux dengan Formula Chroma Brite baru menghasilkan warna ?warna yang lebih cerah
2. Catylac dari Dulux dengan formula baru memberikan hasil cat yang lebih opacity & washability

Tersedia dalam kemasan: 5 Kg dan 25 Kg

Masa Pengeringan: 1 - 2 jam

Daya Sebar Teoritis: 7-10 m2 /Kg

Pengenceran: 20% untuk lapis pertama lalu 10% untuk lapis berikutnya.

Color Selection

A911-44159N Antique White	A911-44132N athene	A911-44198N Bali Green	A911-40553N Cascade	A911-44544N CHRYSAN WHITE	A911-44492N Citrus Grove	A911-42391N Coral spring
A911-42387N Dream land	A911-47331N eastern Spice	A911-45006N Gardena	A911-44504N Golden Blossom	A911-40389N granite grey	A911-45372N Honey Yellow	A911-42353N Jade Green

A911-45325N
Kecapi

A911-44195N
Light cream

A911-45366N
Light Gingerly

A911-44196N
Light Ivory

A911-45120N
Lime

A911-44194N
Linen white


A911-41371N
MAGIC PURPLE

A911-44505N
MARIGOLD

A911-46105N
Mocca

A911-44130N
MOONSTONE

A911-41554N
NORTHWIND

A911-44197N
OFF WHITE

A911-44555N
PAPERLACE


A911-42390N
Paradise Green

A911-43327N
Pingky

A911-44475N
Putih Laguna

A911-44416N
Putih Plus


A911-43375N
RUSSIAN
VELVELT

A911-40115N
Seamist

A911-44122N
Straw


A911-47332N
Sunshine

A911-44177N
SUPER WHITE

A911-41124N
Teardrop


A911-41381N
Venice Blue


A911-45365N
Yellow Sunset

CATALOG



PT. ALEXINDO

GENERAL INFORMATION

Alloy 6063 is a heat-treatable alloy having good combination of extrudability and mechanical properties, also responding well to polishing, anodizing, chemical brightening and dyeing.

Thin-walled hollows and intricate solid shapes could be produced more readily and easily with this alloy.

ALLOY 6063

Aluminium-Magnesium-Silicon alloy (AlMgSiO)

Chemical Composition

%Si	%Fe	%Cu	%Cu	%Mn	%Mg	%Cr	%Zn	%Ti	%Other	%Aluminium
0.35–0.50	0.10–0.30		0.10	0.10	0.35–0.55	0.05	0.10	0.10	0.05	Remainder

Mechanical Properties

Temper	Ultimate Tensile Strength (MPa)	0.2%Proof Stress (MPa)	% Elongation
T4	130	69	14
T5	150	110	7
T6	185	160	7

Physical Properties

Density	2.71 X 10^{-6} kg/mm³
Melting Range	600 – 650 °C
Specific Heat between 0 - 100°C	879 J/kg °C
Coefficient of linear expansion between 20 - 100°C	
Thermal Conductivity at 25°C	23 X 10^{-6} / °C
Electrical Resistivity at 20°C	0.033Ωm
Modulus of Elasticity	69 X 103 MPa

Temper Designation

F - Indicates the as-fabricated condition where to control has been exercised over the temper of the alloy.

T - Indicates the heat treated alloy.

T4 - Solution heat treatment followed by natural ageing at room temperature to a substantial stable condition.

T5 - Artificial ageing after an elevated temperature, rapid cooling fabrication process such as casting or extrusion.

T6 - Solution heat treatment followed by artificial ageing.

For subsequent severe forming process as in bending, please opt for softer tempers.

Mill Finish

Natural aluminium finish of the extrusion-press with no further anodizing or coloring process.

Natural Anidizing Finish

By means of electro-chemical process natural oxide-film will be formed and thickened considerably on the metal surface. The aluminium extrusion is then sealed in hot deionised-water which closes of the pores and permanently seals the oxide film imparting to the metal surface the extreme hardness, corrosion and wear resistance of the oxide.

Alexindo natural anodized finish conform to International Standard an is available in nominal film-thickness of 5, 10, 18 and 25 microns.

For normal and severe atmospheric condition, film thickness of 10 and 25 microns respectively should be recommended.

Colour Finish

In Alexindo colour process, inorganic metal colour particles are deposited and fixed electrolytically at the very base of the process of anodic pores of anodic film allowing virtually full thickness off the anodic film to protect them.

The aluminium extrusion is then sealed in hot deionised water which closes off the pores and permanently sealed in the colour particles.

The colouring process in combination with anodizing is to yield a finish which is lightfast, abrasion and corrosion resistance and unchanging colour intensity.

For normal and severe atmospheric condition, film thickness of 18 and 25 microns respectively should be recommended.

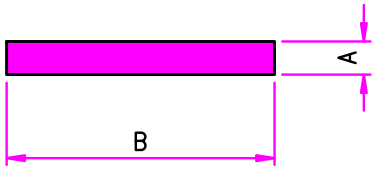
GROUP	CONTENT
1	A. FLAT BARS B. SQUARE BARS C. ROUND BARS
2	A. EQUAL ANGLES B. UNEQUAL ANGLES C. OTHERS
3	A. CHANNELS B. OTHERS
4	A. TEE' SECTIONS B. Z' SECTIONS C. I BEAM SECTIONS
5	A. SQUARE HOLLOW B. RECTANGULAR HOLLOW C. TUBING
6	A. SHOP FRONT 3" ASSEMBLY DETAIL B. SHOP FRONT 3" x 1 1/2" x 1.00 mm C. SHOP FRONT 3" x 1 1/2" x 1.10 mm D SHOP FRONT 3" x 1 1/2" x 1.15 mm E. SHOP FRONT 3" x 1 1/2" x 1.30 mm F. SHOP FRONT 3" x 1 1/2" x 1.60 mm G. SHOP FRONT 60 x 35 x 1.40 mm H. SHOP FRONT 80 x 35 x 1.50 mm I. SHOP FRONT 80 x 38 x 1.50 mm J. OTHERS
7	A. SHOP FRONT 4" ASSEMBLY DETAIL B. SHOP FRONT 4" x 1 3/4" x 1.00 mm C. SHOP FRONT 4" x 1 3/4" x 1.15 mm D. SHOP FRONT 4" x 1 3/4" x 1.25 mm E. SHOP FRONT 4" x 1 3/4" x 1.35 mm F. SHOP FRONT 4" x 1 3/4" x 1.50 mm G. SHOP FRONT 4" x 1 3/4" x 1.80 mm H. OTHERS
8	A. SWING DOOR & SHOP FRONT ASSEMBLY DETAIL B. SWING DOOR 1.30 mm THICK C. SWING DOOR 1.40 mm THICK D. SWING DOOR 1.70 mm THICK E. ECONOMY SWING DOOR 1.20 mm THICK F. FRAME LESS DOOR G. DOOR HANDLE SECTIONS

GROUP	CONTENT
9	A. ROLLING DOOR ASSEMBLY DETAIL B. ROLLING DOOR 0.80 mm THICK C. ROLLING DOOR 0.90 mm THICK D. ROLLING DOOR 1.00 mm THICK E. ROLLING DOOR SECTIONS
10	A. SLIDING WINDOW ASSEMBLY DETAIL B. SLIDING WINDOW 1.00 mm THICK C. SLIDING WINDOW 1.05 mm THICK D. SLIDING WINDOW 1.10 mm THICK E. SLIDING DOOR ASSEMBLY DETAIL F. SLIDING DOOR 1.00 mm THICK G. SLIDING DOOR 1.15 mm THICK H. SLIDING DOOR 1.40 mm THICK I. OTHERS
11	A. PIVOT WINDOW ASSEMBLY DETAIL B. ECONOMY PIVOT WINDOW SECTIONS C. MEDIUM PIVOT WINDOW ASSEMBLY DETAIL D. MEDIUM PIVOT WINDOW SECTIONS E. ECONOMY CASEMENT WINDOW ASSEMBLY DETAIL F. ECONOMY CASEMENT WINDOW SECTIONS G. CASEMENT WINDOW ASSEMBLY DETAIL H. CASEMENT WINDOW 1.05 mm THICK I. CASEMENT WINDOW 1.20 mm THICK J. DOUBLE CASEMENT WINDOW ASSEMBLY DETAIL K. MEDIUM CASEMENT WINDOW SECTIONS
12	A. PARTITION ASSEMBLY DETAIL B. PARTITION SECTIONS C. GYPSUM PARTITION ASSEMBLY DETAIL D. GYPSUM PARTITION 0.90 mm THICK E. GYPSUM PARTITION 1.00 mm THICK F. GYPSUM PARTITION 1.20 mm THICK G. GYPSUM PARTITION THREE WAY JUNCTION ASSEMBLY H. GYPSUM PARTITION SECTIONS I. OTHERS
13	A. CEILING PERSPECTIVE ASSEMBLY DETAIL B. CEILING SECTIONS C. SPANDREL SECTION D. LOUVRE/SUN SCREEN ASSEMBLY DETAIL E. LOUVRE SECTIONS F. HAND RAILING PERSPECTIVE ASSEMBLY DETAIL G. HAND RAILING SECTIONS H. STAIR NOSING SECTIONS I. OTHERS

GROUP	CONTENT
14	A SHOW CASE ASSEMBLY DETAIL B.SHOW CASE SECTIONS C. LADDER SECTIONS D. OTHERS
15	A TRANSPORT SECTIONS B. OTHERS
16	A. LIGHT DUTY CURTAIN WALL ASSEMBLY DETAIL B. LIGHT DUTY CURTAIN WALL SECTIONS C. MEDIUM DUTY CURTAIN WALL SECTIONS D. BACK MULLION CURTAIN WALL ASSEMBLY DETAIL E. BACK MULLION CURTAIN WALL SECTIONS
17	A. ECONOMY CURTAIN WALL ASSEMBLY DETAIL B. ECONOMY CURTAIN WALL SECTIONS C. GLASS TO GLASS CURTAIN WALL ASSEMBLY DETAIL D. GLASS TO GLASS CURTAIN WALL SECTIONS E. WINDOW WALL ASSEMBLY DETAIL F. WINDOW WALL SECTIONS G. PARABOLA SECTIONS H. OTHERS
18	A. CURTAIN TRACK SECTIONS B. ELECTRICAL SECTIONS C. PICTURE FRAME ASSEMBLY DETAIL D. PICTURE FRAME SECTIONS E. AIR VENT SECTIONS F. WALL BOARD SECTIONS G. CARPET SECTIONS H. ADJUST HOOK SECTIONS I. LOW COST HOUSING SECTIONS J. TEXTILE SECTIONS K. AMPLIMESH SECTIONS

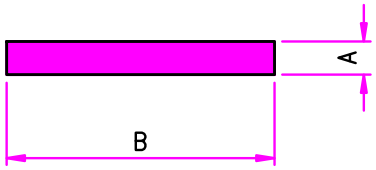
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FLAT BARS — GROUP : 1A-1



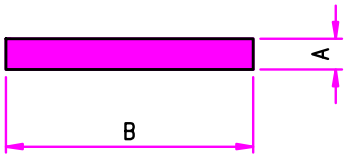
SECTION NO.	A m m	B m m	WEIGHT KG/M	PERIMETER m m
0019	17.00	20.00	0.921	74.00
0020	19.00	55.00	2.832	148.00
0021	13.80	32.20	1.204	92.00
0022	20.55	34.70	1.932	111.30
0023	10.00	25.40	0.688	70.80
0024	0.95	60.00	0.154	121.90
0025	3.00	12.70	0.103	31.40
0030	4.50	19.05	0.232	47.10
0031	4.50	38.10	0.465	85.20
0032	6.00	25.40	0.413	62.80
0033	6.00	38.10	0.620	88.20
0034	6.00	127.00	2.065	266.00
0035	9.00	76.20	1.859	170.40
0036	12.00	50.80	1.652	125.60
0037	4.50	25.40	0.310	59.80
0038	4.50	101.60	1.239	212.20
0040	6.35	25.40	0.437	63.50
0087	3.00	36.00	0.293	78.00
0088	4.00	12.00	0.130	32.00
0143	22.20	50.80	3.056	146.00
0145	45.00	63.50	7.744	217.00
0146	45.00	76.20	9.293	242.40
0147	22.20	63.50	3.820	171.40
0148	22.20	90.00	5.415	224.40
0149	22.20	76.20	4.584	196.80
0150	22.20	101.60	6.112	247.00
0151	22.20	127.00	7.641	298.40
0152	28.60	90.00	6.976	237.20
0153	28.60	127.00	9.843	311.20
0154	22.20	38.10	2.292	120.60
0155	35.00	76.20	7.228	222.40
0156	35.00	90.00	8.537	250.00
0157	35.00	101.60	9.637	273.20
0158	22.20	152.40	9.169	349.00
0159	28.60	63.50	4.922	184.20

FLAT BARS **GROUP : 1A-2**



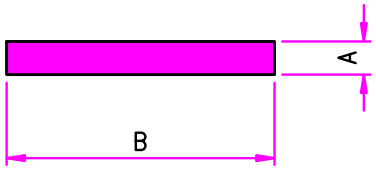
SECTION NO.	A m m	B m m	WEIGHT KG/M	PERIMETER m m
0160	28.60	50.80	3.937	158.80
0161	28.60	38.10	2.953	133.40
0162	35.00	50.80	4.818	171.00
0163	28.60	76.20	5.906	209.60
0164	28.60	101.60	7.875	260.40
0165	35.00	63.50	6.023	197.00
0176	38.10	90.00	9.293	256.20
0177	50.80	63.50	8.742	228.60
0178	3.00	50.00	0.407	106.00
0205	2.00	25.00	0.136	54.00
0206	2.50	40.00	0.271	85.00
0207	2.70	38.10	0.279	81.00
0208	5.00	80.00	1.084	170.00
0212	1.00	38.10	0.103	286.00
0217	68.00	78.00	13.740	286.00
0218	50.80	101.60	13.987	304.80
0219	50.80	76.20	10.490	254.00
0221	32.00	90.00	7.805	244.00
0222	38.10	63.50	6.556	203.20
0223	38.10	76.20	7.868	228.60
0224	20.00	100.00	5.420	240.00
0225	25.40	90.00	6.195	230.80
0226	25.40	101.60	6.994	254.00
0227	32.00	76.20	6.608	216.40
0244	2.88	18.00	0.140	41.76
0245	6.00	50.00	0.813	112.00
0246	1.30	25.40	0.089	53.50
0247	1.35	19.05	0.070	40.80
0249	1.25	12.70	0.043	27.90
0253	1.00	11.00	0.030	24.00
0256	1.30	50.00	0.176	102.60
0257	1.50	40.00	0.163	83.00
0258	3.18	25.40	0.219	57.16
0258R	3.00	25.00	0.203	56.00
0259	3.18	19.05	0.164	44.46

FLAT BARS **GROUP : 1A-3**



SECTION NO.	A m m	B m m	WEIGHT KG/M	PERIMETER m m
0260	1.65	73.00	0.326	149.40
0261	0.80	10.00	0.025	22.00
0263	3.95	74.80	0.800	158.00
0264	1.45	50.00	0.196	103.10
0265	5.70	34.85	0.538	81.60
0266	4.90	14.85	0.197	40.00
0267	4.50	25.00	0.305	59.00
0268	1.50	53.00	0.215	109.00
0270	5.00	50.00	0.679	110.00
0271	5.00	12.70	0.172	35.40
0272	12.00	120.00	3.906	264.00
0274	13.00	75.00	2.642	176.00
0275	2.00	60.00	0.325	124.00
0276	4.00	38.10	0.413	84.20
0277	13.00	150.00	5.285	326.00
0278	0.90	12.00	0.029	27.40
0282	3.00	63.50	0.516	133.00
0283	6.00	101.60	1.652	215.20
0284	3.00	40.00	0.325	86.00
0285	15.87	76.20	3.277	184.14
0286	4.50	50.80	0.620	110.60
0287	3.18	63.50	0.547	133.36
0288	3.18	76.20	0.657	158.76
0289	4.76	25.40	0.328	60.32
0290	4.76	50.80	0.655	111.12
0291	4.76	76.20	0.983	161.92
0292	6.35	12.70	0.219	38.10
0293	6.35	31.75	0.546	76.20
0294	6.35	38.10	0.656	88.90
0295	6.35	50.80	0.874	114.30
0296	9.53	25.40	0.656	69.86
0297	9.53	38.10	0.984	95.26
0298	9.53	76.20	1.968	171.46
0299	9.53	101.60	2.624	222.26
0300	12.70	25.40	0.874	76.20

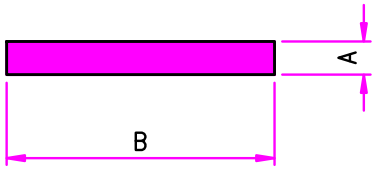
FLAT BARS **GROUP : 1A-4**



SECTION NO.	A m m	B m m	WEIGHT KG/M	PERIMETER m m
0301	12.70	50.80	1.748	127.00
0302	12.70	63.50	2.185	152.40
0303	12.70	101.60	3.497	228.60
0304	15.88	63.50	2.733	158.76
0305	15.88	76.20	3.279	184.16
0307	25.40	38.10	2.623	127.00
0308	25.40	101.60	6.994	254.00
0309	25.40	127.00	8.742	304.80
0310	4.50	63.50	0.774	136.00
0311	12.70	31.75	1.093	88.90
0312	12.70	152.50	5.249	330.40
0313	19.05	76.20	3.934	190.50
0314	25.40	50.89	3.503	152.58
0318	4.50	31.75	0.387	72.50
0319	9.00	25.40	0.620	68.80
0321	12.00	76.20	2.478	176.40
0325	9.00	50.00	1.220	118.00
0326	6.00	63.50	1.033	139.00
0327	2.80	19.00	0.144	43.60
0329	2.00	40.00	0.217	84.00
0331	10.00	40.00	1.084	100.00
0332	2.50	25.40	0.172	55.80
0333	3.20	16.50	0.148	39.40
0335	45.00	110.00	13.427	310.00
0336	2.80	15.80	0.120	37.35
0337	65.00	95.00	16.734	320.00
0338	35.00	50.00	4.735	161.416
0339	42.00	62.00	7.064	208.00
0342	3.00	25.15	0.204	56.30
0343	1.90	80.00	0.412	163.80
0344	38.10	76.20	7.875	228.60
0345	2.20	162.00	0.966	328.40
0346	3.00	16.00	0.130	38.00
0348	30.00	70.00	5.657	200.00
0349	35.00	94.00	8.916	258.00

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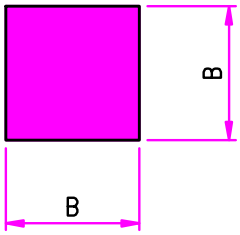
FLAT BARS **GROUP : 1A-5**



SECTION NO.	A m m	B m m	WEIGHT KG/M	PERIMETER m m
0364	3.00	25.40	0.207	56.80
0365	9.53	31.75	0.820	82.56
0366	9.53	50.80	1.312	120.66
0367	9.53	63.50	1.640	146.06
0383	6.00	76.20	1.239	164.40
0384	6.00	152.40	2.478	316.80
0385	12.00	19.05	0.656	63.50
0386	15.88	31.75	1.366	95.26
0387	15.88	101.60	4.372	234.96
0630	1.00	25.40	0.069	52.80
0676	32.00	115.00	9.973	294.00
0677	32.00	155.00	13.442	374.00
0678	42.00	98.00	11.192	280.00
0679	36.00	115.00	11.219	302.00
0680	31.00	177.50	14.912	417.00
0753	31.00	158.00	13.274	378.00
0754	2.00	19.05	0.103	42.10
0755	8.00	101.60	2.203	219.20
1084	0.90	19.05	0.046	39.90
1208	1.25	101.60	0.344	205.70
2859	5.00	25.00	0.339	60.00
2974	8.00	40.00	0.867	96.00
3850	3.00	50.80	0.413	62.80
3851	3.00	38.10	0.310	82.20
4325	3.10	83.25	0.699	172.70
4429	0.80	19.05	0.041	59.70
4822	2.80	25.40	0.193	56.40
5550	2.15	100.00	0.582	204.55
7440	5.50	200.00	2.981	411.00
8531	6.00	50.00	0.813	112.00
9758	5.00	31.75	0.430	73.50
9759	5.00	50.80	0.688	111.60
9760	5.00	72.00	0.976	154.00

SQUARE BARS

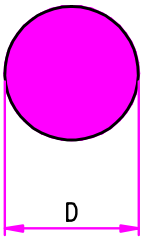
GROUP : 1B-1



SECTION NO.	B m m	WEIGHT KG/ m	PERIMETER m m
10	10.00	0.270	40.00
13	20.00	1.080	80.00
14	25.00	1.690	100.00
15	9.50	0.243	38.00
17	8.30	0.182	33.20
18	7.60	0.153	30.40
27	25.40	1.748	101.60
28	63.50	10.930	254.00
29	76.20	15.735	304.80
39	15.88	0.683	63.50
144	45.00	5.488	180.00
220	50.80	6.994	203.20
315	12.70	0.437	50.80
316	31.75	2.732	127.00
317	19.05	0.983	76.20
324	38.10	3.934	152.40
328	7.80	0.165	31.20
351	30.00	2.439	120.00
352	31.75	2.732	127.00
368	9.53	0.246	38.12
1158	11.80	0.377	47.20
6548	6.00	0.097	23.14

ROUND BARS

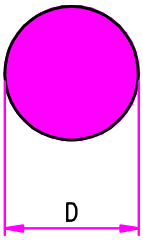
GROUP : 1C-1



SECTION NO.	D m m	WEIGHT KG/M	PERIMETER m m
41	8.00	0.136	25.13
42	10.00	0.213	31.416
43	57.15	0.952	179.54
44	22.23	1.051	69.82
45	3.15	0.021	9.90
46	49.00	5.115	153.94
47	31.75	2.148	99.75
49	52.00	5.755	163.36
50	28.30	1.705	89.54
51	25.40	1.373	79.80
52	38.10	3.090	119.69
53	57.15	6.952	179.54
54	7.94	0.134	24.94
55	31.75	2.146	99.75
56	19.05	0.772	59.85
57	36.00	2.758	113.09
58	32.60	2.262	102.42
59	25.50	1.384	80.11
60	15.88	0.536	49.86
61	9.53	0.193	29.94
62	7.00	0.104	21.99
63	6.70	0.096	21.05
64	11.00	0.258	34.56
65	7.80	0.129	24.50
68	6.80	0.098	21.36
69	88.00	16.498	276.46
72	50.00	5.326	157.079
73	72.00	11.044	226.195
74	4.00	0.034	12.57
75	6.00	0.077	18.85
76	8.50	0.154	26.70

ROUND BARS

GROUP : 1C-2

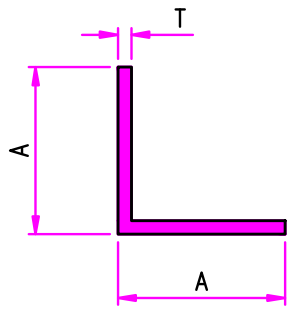


SECTION NO.	D m m	WEIGHT KG/M	PERIMETER m m
77	12.70	0.343	39.90
133	76.20	12.359	239.39
134	90.00	17.240	282.74
139	82.00	14.312	257.61
140	69.85	10.385	219.44
141	45.00	4.310	141.37
142	63.50	8.582	199.49
3637	4.50	0.043	14.14
3847	5.00	0.053	15.71
6323	100.00	21.284	314.16
6324	80.00	13.622	215.33
8334	50.80	5.493	159.59

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EQUAL ANGLES

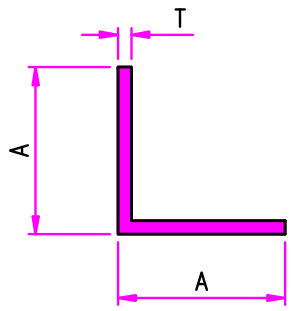
GROUP : 2A-1



SECTION NO.	A m m	T m m	WEIGHT KG/M	PERIMETER m m
213	15.00	2.00	0.161	63.52
388	31.75	3.00	0.492	127.00
389	76.20	3.00	1.215	304.80
390	76.20	9.00	3.498	304.80
393	63.50	9.00	2.878	254.00
400	25.40	0.80	0.108	101.60
405	25.40	0.90	0.122	101.60
406	19.05	0.90	0.091	76.20
407	15.88	0.90	0.075	63.52
408	12.70	0.90	0.060	50.80
409	9.52	0.90	0.044	38.10
501	9.50	0.95	0.046	38.00
504	20.00	2.00	0.206	80.00
505	25.00	2.00	0.260	100.00
516	50.00	5.00	1.287	200.00
517	50.80	1.10	0.300	203.20
520	25.50	0.95	0.129	102.00
523	10.00	2.00	0.098	40.00
525	19.00	1.00	0.101	76.00
526	40.00	2.00	0.423	160.00
527	50.80	2.00	0.540	203.20
528	60.00	2.00	0.640	240.00
531	20.00	3.00	0.301	80.00
534	25.00	3.00	0.382	100.00
536	50.00	3.00	0.789	200.00
549	30.30	3.00	0.468	121.20
555	12.60	0.95	0.062	50.80
555T	12.60	1.30	0.084	50.40
556T	16.00	1.30	0.108	64.00
557	30.00	5.00	0.745	120.00
558	40.00	4.00	0.824	160.00

EQUAL ANGLES

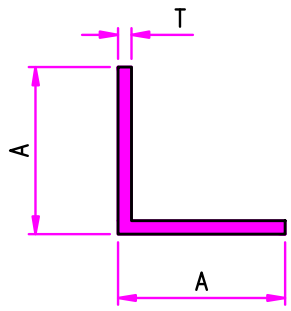
GROUP : 2A-2



SECTION NO.	A m m	T m m	WEIGHT KG/M	PERIMETER m m
559	40.00	5.00	1.016	160.00
560	70.00	7.00	2.523	280.00
563	31.80	1.10	0.186	127.20
564	38.10	1.10	0.224	152.40
565	38.10	1.00	0.204	152.40
566	50.80	1.50	0.407	203.20
567	31.75	2.80	0.461	127.00
568	9.525	0.90	0.044	38.10
569	12.70	1.00	0.066	50.80
570	15.88	1.00	0.083	63.52
571	19.05	1.00	0.100	76.20
572	25.40	0.90	0.122	101.60
572A	25.40	1.00	0.135	101.60
573	31.75	1.10	0.186	127.00
596	12.70	1.00	0.066	50.80
598	12.70	1.20	0.079	50.80
599	19.05	1.20	0.120	76.20
600	30.00	2.00	0.314	120.00
601	50.00	2.60	0.645	224.85
609	12.70	1.30	0.085	50.80
610	65.90	7.80	2.621	263.60
612	16.00	3.00	0.236	64.00
620	25.40	3.00	0.389	101.60
628	50.80	3.80	1.007	203.20
661	19.05	2.70	0.259	76.20
662	25.40	2.70	0.352	101.60
663	38.10	2.70	0.538	152.40
671	25.00	1.80	0.233	99.282
686	50.80	9.00	2.259	203.20
687	101.60	9.00	4.737	406.40
689	101.60	6.35	3.408	406.40

EQUAL ANGLES

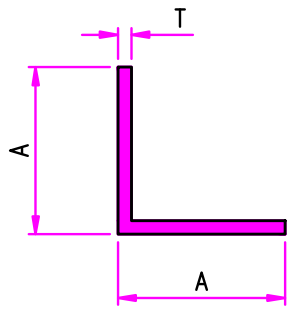
GROUP : 2A-3



SECTION NO.	A m m	T m m	WEIGHT KG/M	PERIMETER m m
690	101.60	10.00	5.257	405.40
695	38.10	4.50	0.874	152.40
696	76.20	4.50	1.804	304.80
697	76.20	6.00	2.380	304.80
702	50.80	4.50	1.184	203.20
703	63.50	3.00	1.008	254.00
704	38.10	3.00	0.595	152.40
705	50.80	3.00	0.802	203.20
706	50.80	6.00	1.554	203.20
708	25.40	4.50	0.565	101.60
709	25.00	3.00	0.382	100.00
710	88.90	6.00	2.793	355.60
711	30.00	1.80	0.284	120.00
712	63.50	6.00	1.967	254.00
713	101.60	7.93	4.196	406.40
714	101.60	12.70	6.556	406.40
720	50.00	4.00	1.041	200.00
748	19.05	0.80	0.081	76.20
751	37.30	1.00	0.199	149.20
759	37.30	2.00	0.393	149.20
1075	25.40	1.30	0.174	101.60
1609	12.00	0.90	0.058	48.00
1610	15.00	0.90	0.071	60.00
1611	19.00	0.90	0.090	76.00
1612	25.00	0.90	0.120	100.00
1613	30.00	0.90	0.144	120.00
1614	38.00	0.90	0.203	152.00
1615	9.00	0.90	0.042	36.00
2538	32.00	3.00	0.496	128.00
2539	25.00	2.50	0.322	100.00

EQUAL ANGLES

GROUP : 2A-4

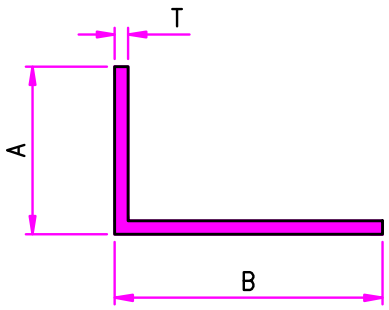


SECTION NO.	A m m	T m m	WEIGHT KG/M	PERIMETER m m
2540	38.00	4.50	0.872	152.00
2549	50.00	5.00	1.287	200.00
3164	40.00	3.00	0.626	160.00
4505	35.00	1.20	0.224	139.61
5554	38.10	2.00	0.402	152.40
9911	19.05	2.00	0.196	76.20
9912	45.00	3.00	0.707	180.00
9915	31.75	0.90	0.153	127.00

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

UNEQUAL ANGLES

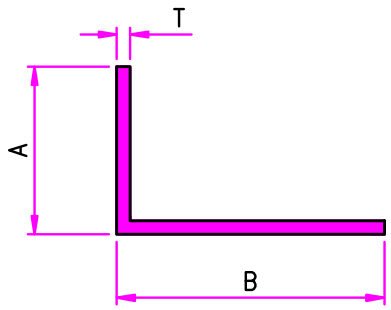
GROUP : 2B-1



SECTION NO.	A m m	B m m	T m m	WEIGHT KG/M	PERIMETER m m
202	18.00	42.00	2.00	0.249	96.00
369	19.05	38.10	3.00	0.440	114.30
370	50.80	76.20	6.00	1.967	254.00
392	76.20	152.40	6.00	3.619	457.20
397	16.00	30.00	1.50	0.181	92.00
401	12.70	38.10	0.90	0.122	101.60
402	12.70	44.45	0.90	0.137	114.30
403	12.70	19.05	0.90	0.075	63.50
404	12.70	25.40	0.90	0.091	76.20
423	25.40	50.80	1.05	0.214	152.40
433	25.40	38.10	0.90	0.152	127.00
434	12.70	50.80	0.90	0.153	127.00
551	9.53	19.05	1.00	0.075	57.15
574	12.70	25.40	0.90	0.091	76.20
584	10.00	15.00	2.00	0.125	50.00
585	25.50	50.50	1.25	0.254	152.00
586	15.00	20.00	2.00	0.180	70.00
587	15.00	40.00	1.30	0.189	110.00
589	25.00	40.00	3.00	0.504	130.00
602	15.00	25.00	1.50	0.157	80.00
603	15.00	48.00	1.50	0.250	126.00
604	18.00	32.00	1.50	0.197	100.00
605	20.00	35.00	1.50	0.217	110.00
607	19.05	31.75	3.00	0.389	101.60
608	15.00	25.00	2.00	0.206	80.00
611	12.70	19.05	0.80	0.067	63.50
613	20.00	30.00	2.00	0.260	100.00
615	25.00	35.00	2.00	0.314	120.00
617	25.00	50.00	2.00	0.396	150.00
618	11.00	12.70	1.40	0.086	47.40
619	12.70	50.80	1.40	0.236	127.00
621	20.00	40.00	3.00	0.463	120.00
629	28.00	36.00	2.00	0.336	128.00

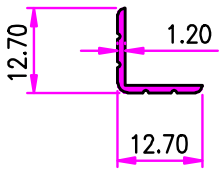
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

UNEQUAL ANGLES — GROUP : 2B-2

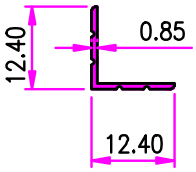


SECTION NO.	A m m	B m m	T m m	WEIGHT KG/M	PERIMETER m m
651	12.70	19.50	0.95	0.080	64.40
652	12.60	25.00	1.00	0.099	75.20
656	12.70	25.40	1.20	0.120	76.20
657	6.35	25.40	1.20	0.099	63.50
658	12.70	19.05	1.10	0.091	63.50
660	12.70	16.00	1.00	0.075	57.40
664	25.40	50.80	5.00	0.965	152.40
665	12.20	50.00	1.60	0.267	126.40
666	6.00	12.60	1.30	0.061	37.20
667	11.00	17.00	1.50	0.108	56.00
668	11.00	15.00	1.30	0.087	52.00
669	5.00	20.50	3.00	0.183	51.00
670	12.70	47.80	2.00	0.317	121.00
673	15.00	30.00	1.80	0.216	92.00
685	17.00	30.00	2.10	0.256	94.00
688	50.80	76.20	4.50	1.494	254.00
698	25.40	38.10	3.00	0.492	127.00
699	50.80	101.60	6.00	2.380	304.80
700	50.00	75.00	4.50	1.469	250.00
701	63.00	100.00	4.50	1.933	326.00
718	25.40	76.20	3.00	0.802	203.20
747	25.40	101.60	1.20	0.409	254.00
750	13.50	27.00	1.50	0.159	81.00
902	12.70	22.22	2.35	0.208	69.84
1713	14.00	21.00	1.50	0.136	70.50
2942	30.00	65.00	8.00	1.886	190.00
3295	15.00	18.00	2.00	0.168	66.00
4428	12.70	19.00	2.30	0.183	63.40
5599	19.00	38.00	2.00	0.298	114.00
5824	14.00	40.00	3.80	0.517	108.00

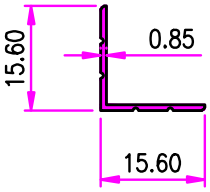
OTHERS **GROUP : 2C-1**



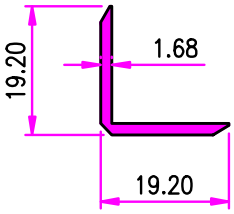
DIE 510
W : 0.079 KG/M
P : 50.80 MM



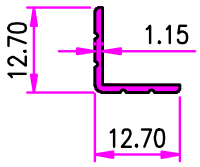
DIE 592
W : 0.053 KG/M
P : 50.80 MM



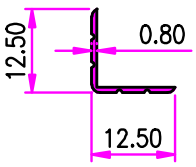
DIE 593
W : 0.070 KG/M
P : 63.50 MM



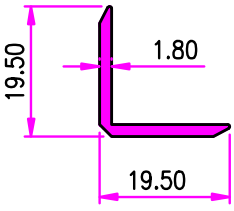
DIE 591
W : 0.156 KG/M
P : 76.20 MM



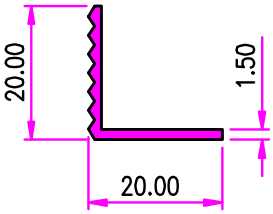
DIE 719
W : 0.074 KG/M
P : 50.46 MM



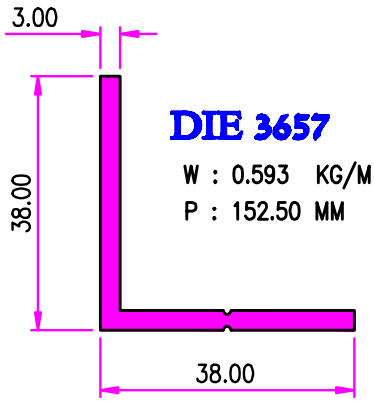
DIE 7876
W : 0.049 KG/M
P : 49.34 MM



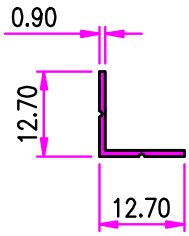
DIE 4331
W : 0.168 KG/M
P : 74.63 MM



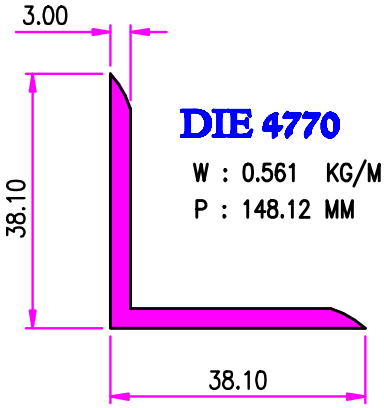
DIE 1187
W : 0.152 KG/M
P : 81.84 MM



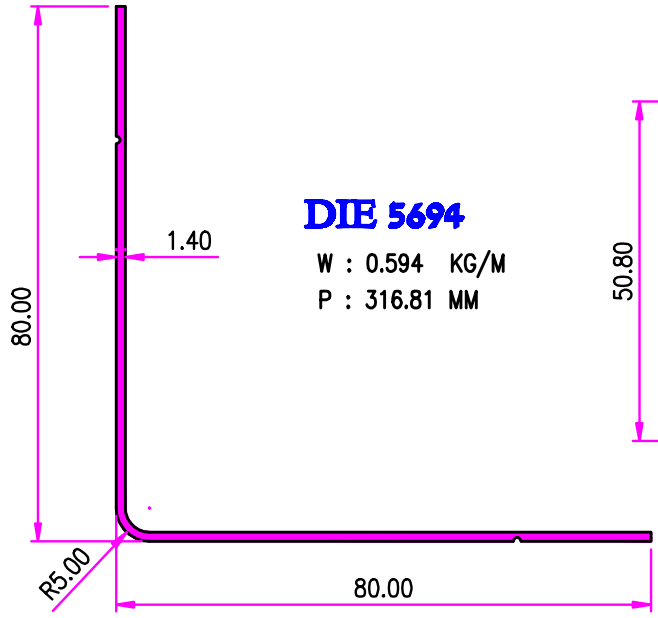
DIE 3657
W : 0.593 KG/M
P : 152.50 MM



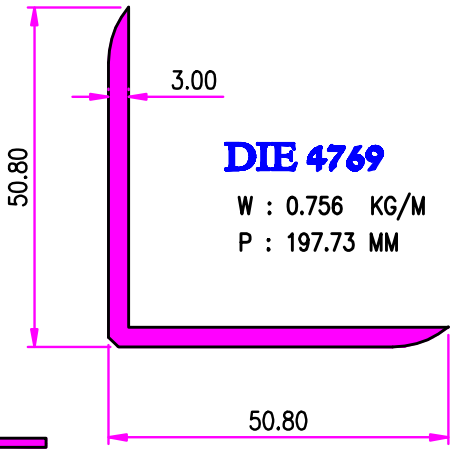
DIE 4713
W : 0.059 KG/M
P : 51.30 MM



DIE 4770
W : 0.561 KG/M
P : 148.12 MM

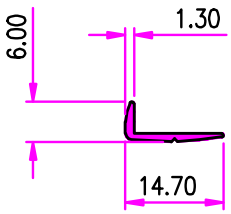


DIE 5694
W : 0.594 KG/M
P : 316.81 MM



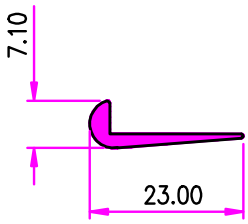
DIE 4769
W : 0.756 KG/M
P : 197.73 MM

OTHERS **GROUP : 2C-2**



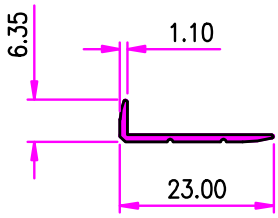
DIE 655T

W : 0.062 KG/M
P : 41.40 MM



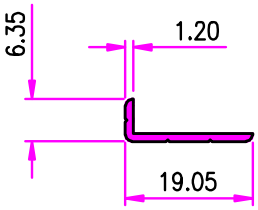
DIE 1189

W : 0.117 KG/M
P : 55.39 MM



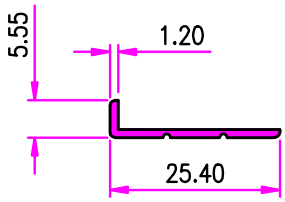
DIE 595

W : 0.080 KG/M
P : 58.54 MM



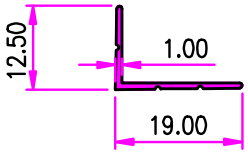
DIE 672

W : 0.076 KG/M
P : 50.80 MM



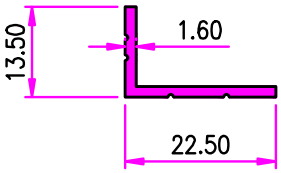
DIE 657T

W : 0.096 KG/M
P : 59.50 MM



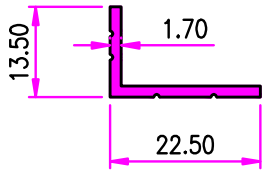
DIE 658A

W : 0.075 KG/M
P : 64.10 MM



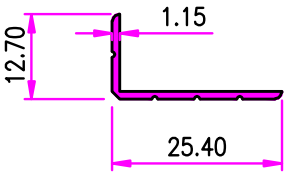
DIE 6377

W : 0.148 KG/M
P : 72.99 MM



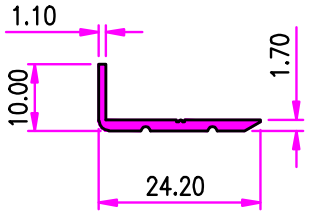
DIE 7880

W : 0.157 KG/M
P : 72.99 MM



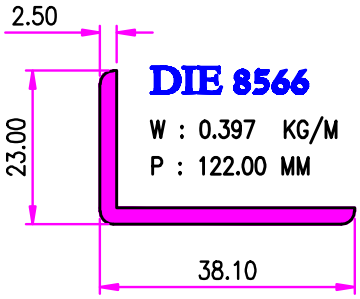
DIE 656A

W : 0.113 KG/M
P : 76.20 MM



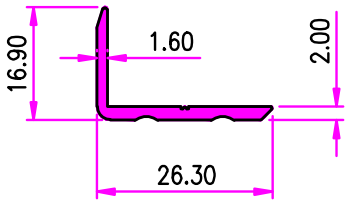
DIE 3245

W : 0.126 KG/M
P : 69.60 MM



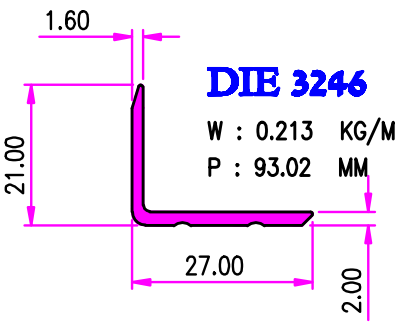
DIE 8566

W : 0.397 KG/M
P : 122.00 MM



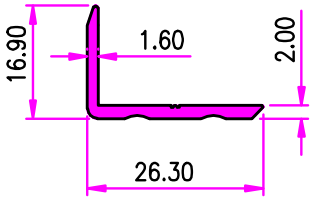
DIE 3243R

W : 0.188 KG/M
P : 84.87 MM



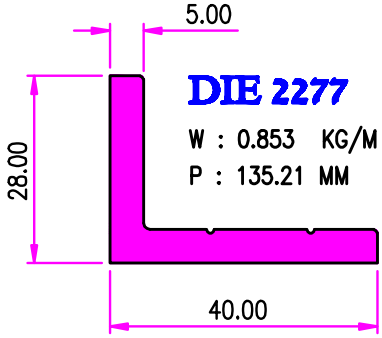
DIE 3246

W : 0.213 KG/M
P : 93.02 MM



DIE 3243

W : 0.190 KG/M
P : 84.90 MM

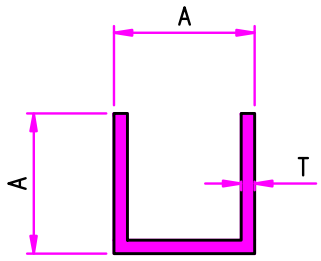


DIE 2277

W : 0.853 KG/M
P : 135.21 MM

CHANNELS

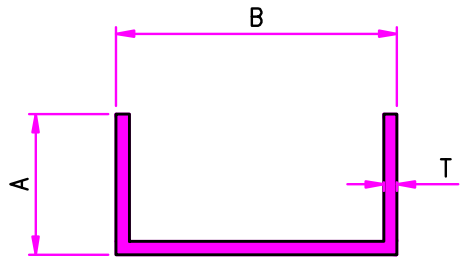
GROUP : 3A-1



SECTION NO.	A m m	T m m	WEIGHT KG/M	PERIMETER m m
481	12.70	0.90	0.089	74.40
482	9.52	0.80	0.058	55.52
487	19.05	2.50	0.353	109.30
489	25.40	2.80	0.536	146.80
490	19.05	2.40	0.340	109.50
631	25.00	2.70	0.506	144.60
635	12.70	0.90	0.090	73.00
639	19.05	0.98	0.147	112.00
640	15.88	1.00	0.124	93.28
641	12.70	1.20	0.116	73.80
642	15.87	1.20	0.147	92.85
646	9.525	1.20	0.085	54.75
648	22.30	1.60	0.276	130.60
1001	9.525	0.80	0.058	55.55
1002	9.50	0.95	0.068	55.10
1004	12.70	1.00	0.098	74.20
1005	12.70	0.80	0.079	74.60
1008	19.00	2.00	0.287	110.00
1010	25.00	3.00	0.561	144.00
1011	25.40	1.00	0.201	150.40
1012	15.88	1.50	0.181	92.28
1018	15.00	1.00	0.117	88.00
1047	40.00	3.00	0.927	234.00
1064	50.00	1.75	0.695	296.50
1070	20.00	3.00	0.440	114.00
1078	19.05	0.95	0.142	112.40
8801	38.00	1.40	0.422	225.20
9595	25.40	2.30	0.446	147.80
9639	18.00	1.50	0.207	105.00

CHANNELS

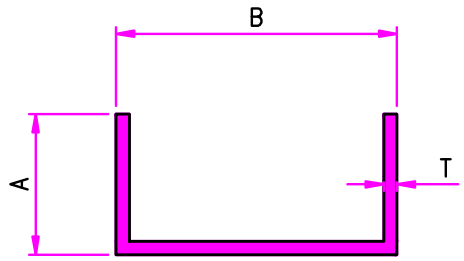
GROUP : 3A-2



SECTION NO.	A m m	B m m	T m m	WEIGHT KG/M	PERIMETER m m
376	38.10	76.20	3.00	2.283	292.80
377	50.80	101.60	6.00	3.109	394.40
483	12.70	44.45	0.90	0.166	137.90
488	15.70	9.35	1.05	0.109	78.50
502	25.40	38.10	1.10	0.258	175.60
503	12.70	38.10	1.00	0.167	125.00
575	9.00	9.375	0.75	0.053	55.12
576	12.00	12.70	0.75	0.072	74.17
577	12.70	7.94	0.90	0.077	65.08
578	15.00	40.40	1.20	0.221	138.40
633	25.50	32.00	1.50	0.325	163.00
634	16.75	48.00	1.20	0.257	160.40
638	8.00	32.70	1.30	0.169	98.00
643	25.40	38.10	1.30	0.304	175.20
644	13.00	28.00	1.00	0.141	106.00
649	24.70	15.50	1.50	0.281	124.00
650	25.10	38.10	1.00	0.234	174.60
724	19.05	38.10	3.00	0.571	146.40
725	38.10	76.20	6.00	2.283	292.80
726	50.80	101.60	6.00	3.109	394.40
727	76.20	152.40	8.00	5.670	597.60
728	50.80	101.60	8.00	3.743	394.40
729	50.80	101.60	3.00	1.603	400.40
879	15.80	9.50	1.00	0.106	80.40
1003	10.00	20.00	2.00	0.195	76.00
1006	15.00	25.00	2.00	0.276	106.00
1015	50.00	100.00	5.00	2.575	390.00
1021	15.00	25.00	1.50	0.211	107.00
1023	5.00	60.00	2.00	0.358	136.00
1025	15.00	10.00	2.00	0.195	76.00
1027	20.00	30.00	2.00	0.358	136.00

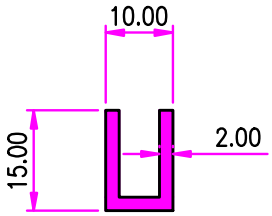
CHANNELS

GROUP : 3A-3



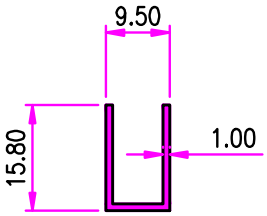
SECTION NO.	A m m	B m m	T m m	WEIGHT KG/M	PERIMETER m m
1028	22.00	45.00	2.00	0.461	174.00
1031	67.00	40.00	2.00	0.775	290.00
1037	10.00	35.00	2.50	0.340	105.00
1046	30.00	111.00	3.00	1.341	336.00
1062	9.20	12.50	1.00	0.078	59.80
1063	7.80	12.70	1.50	0.123	63.40
1065	6.00	9.20	1.50	0.074	39.40
1066	60.00	120.00	6.00	3.707	468.00
1067	60.00	100.00	10.00	5.420	420.00
1068	40.00	80.00	5.00	2.033	310.00
1069	20.00	30.00	2.00	0.520	134.00
1071	12.70	25.40	1.20	0.157	99.40
1072	13.00	32.00	1.60	0.238	112.80
1073	13.00	16.00	1.60	0.168	80.80
1079	12.70	50.80	1.10	0.221	150.20
1080	8.00	38.10	1.10	0.155	106.00
1081	12.70	50.80	1.18	0.236	150.00
1085	12.70	25.40	0.90	0.120	99.80
1098	25.40	76.20	3.00	0.984	248.00
1100	5.00	14.00	1.50	0.115	43.00
1144	12.70	17.46	2.54	0.260	80.64
1209	76.20	25.40	2.40	1.125	350.80
3214	20.00	40.00	1.10	0.232	157.80
3848	12.70	19.05	1.00	0.115	86.90
4575	19.05	101.60	1.00	0.374	276.54
4792	30.00	73.40	1.20	0.426	264.40
5565	17.00	20.50	1.00	0.192	105.00
8242	14.00	14.40	1.00	0.111	82.60
9640	18.00	16.00	1.50	0.199	101.00
9933	5.00	100.00	1.00	0.293	218.00
9959	50.00	27.00	2.50	0.828	248.14

OTHERS **GROUP : 3B-1**



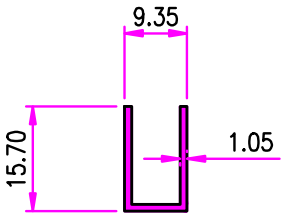
DIE 1025

W : 0.195 KG/M
P : 76.00 MM



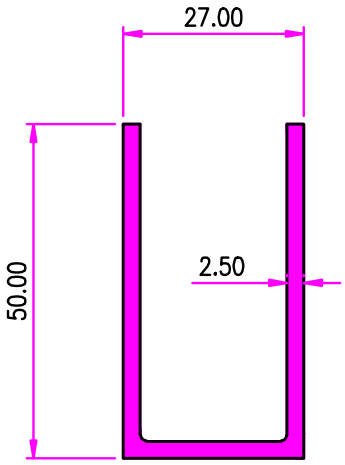
DIE 879

W : 0.106 KG/M
P : 80.40 MM



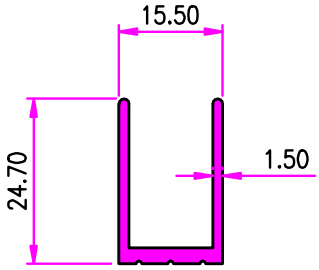
DIE 488

W : 0.109 KG/M
P : 78.50 MM



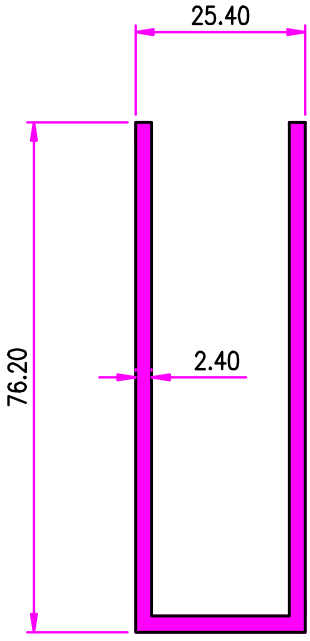
DIE 9959

W : 0.828 KG/M
P : 248.14 MM



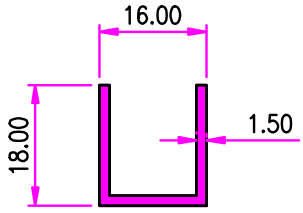
DIE 649

W : 0.281 KG/M
P : 124.00 MM



DIE 1209

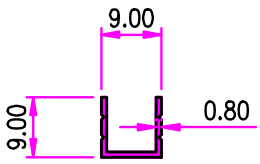
W : 1.125 KG/M
P : 350.80 MM



DIE 9640

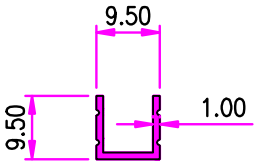
W : 0.199 KG/M
P : 101.00 MM

OTHERS **GROUP : 3B-2**



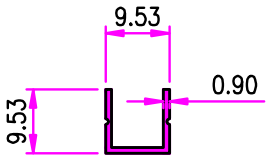
DIE 7875

W : 0.054 KG/M
P : 53.39 MM



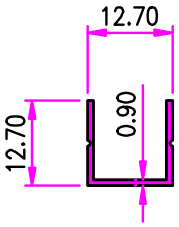
DIE 1077A

W : 0.071 KG/M
P : 55.83 MM



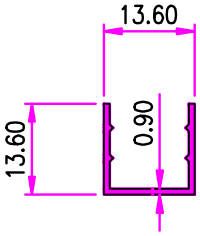
DIE 4715

W : 0.065 KG/M
P : 55.88 MM



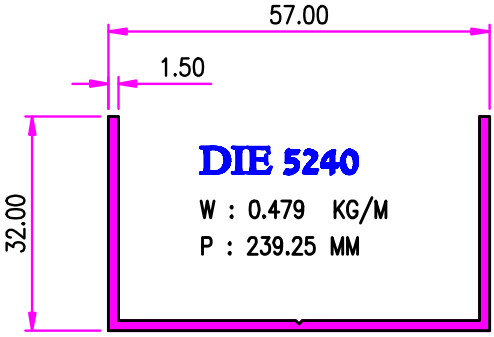
DIE 4714

W : 0.088 KG/M
P : 74.90 MM



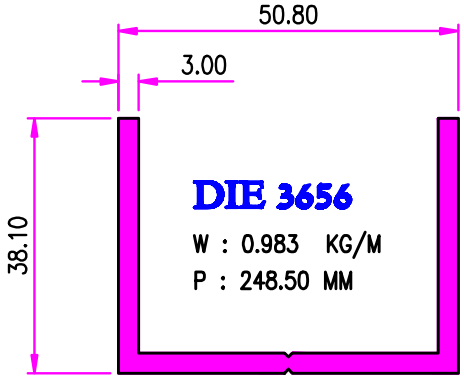
DIE 636

W : 0.101 KG/M
P : 81.50 MM



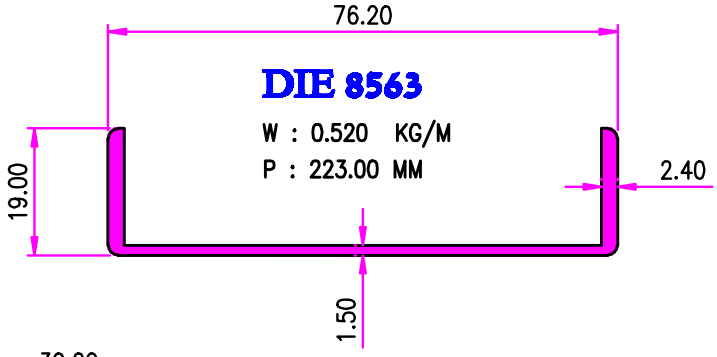
DIE 5240

W : 0.479 KG/M
P : 239.25 MM



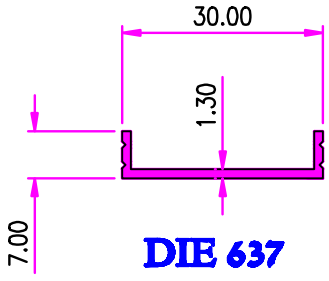
DIE 3656

W : 0.983 KG/M
P : 248.50 MM



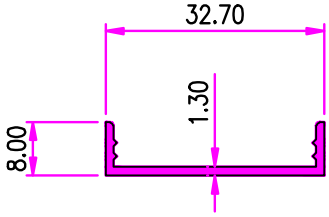
DIE 8563

W : 0.520 KG/M
P : 223.00 MM



DIE 637

W : 0.153 KG/M
P : 85.60 MM

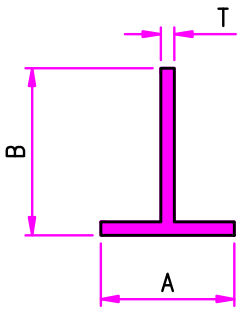


DIE 638

W : 0.169 KG/M
P : 98.00 MM

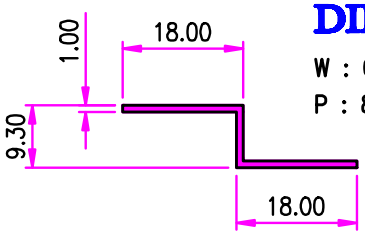
TEE SECTIONS

GROUP : 4A-1



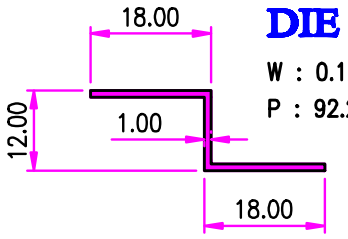
SECTION NO.	A m m	B m m	T m m	WEIGHT KG/M	PERIMETER m m
378	38.10	38.10	3.00	0.595	152.40
379	38.10	38.10	4.00	0.874	152.40
432	19.05	19.05	0.90	0.091	76.20
961	50.80	50.80	3.00	0.802	203.20
962	50.80	50.80	6.00	1.554	203.20
963	50.00	30.00	1.80	0.381	160.00
967	30.00	34.00	1.10	0.188	128.00
968	42.50	39.60	5.00	0.777	172.71
969	25.00	25.00	2.00	0.260	100.00
1185	19.00	19.00	3.30	0.310	76.00
1186	40.00	40.00	3.30	0.686	160.00
1511	35.00	35.00	1.50	0.278	140.00
1517	54.00	50.00	2.00	0.553	208.00
1540	30.00	18.00	1.20	0.152	96.00
1541	12.60	12.60	1.00	0.066	50.40
1542	25.40	25.40	0.95	0.128	101.60
1544	19.00	30.00	1.00	0.130	98.00
1545	19.05	19.05	1.00	0.101	76.20
2550	125.00	50.80	4.00	1.862	351.60
7162	19.05	33.40	1.20	0.169	104.78
8081	15.00	38.60	1.00	0.143	107.20

Z' SECTIONS **GROUP : 4B-1**



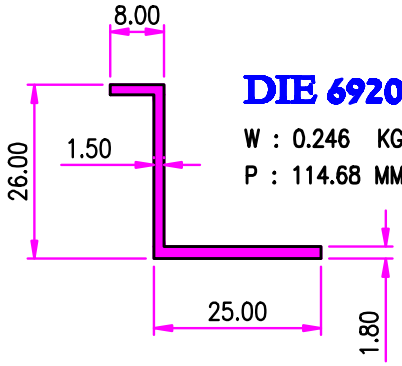
DIE 2949

W : 0.115 KG/M
P : 86.68 MM



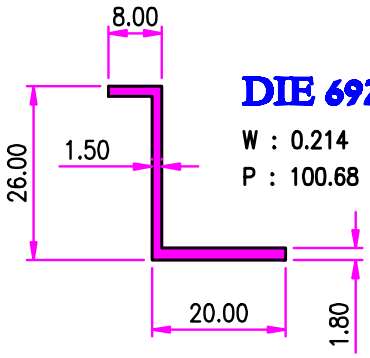
DIE 2900

W : 0.123 KG/M
P : 92.28 MM



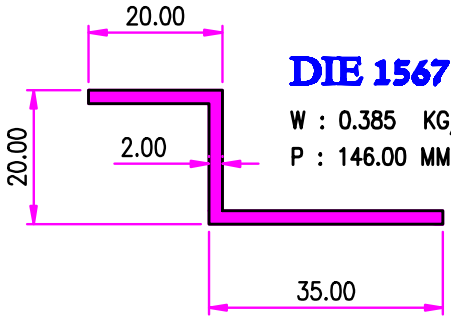
DIE 6920

W : 0.246 KG/M
P : 114.68 MM



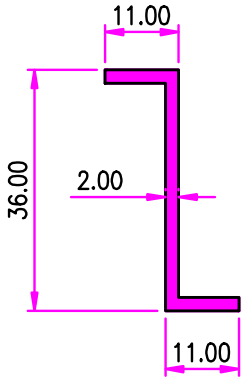
DIE 6921

W : 0.214 KG/M
P : 100.68 MM



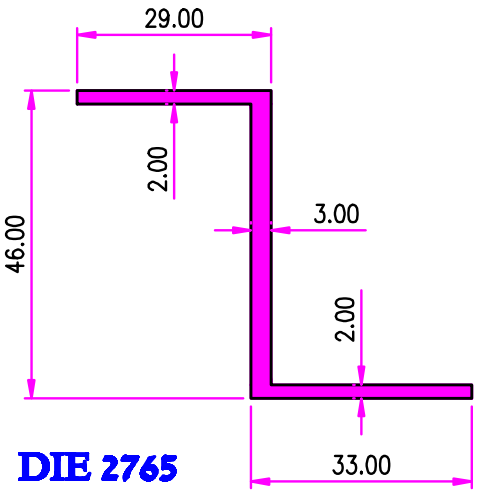
DIE 1567

W : 0.385 KG/M
P : 146.00 MM



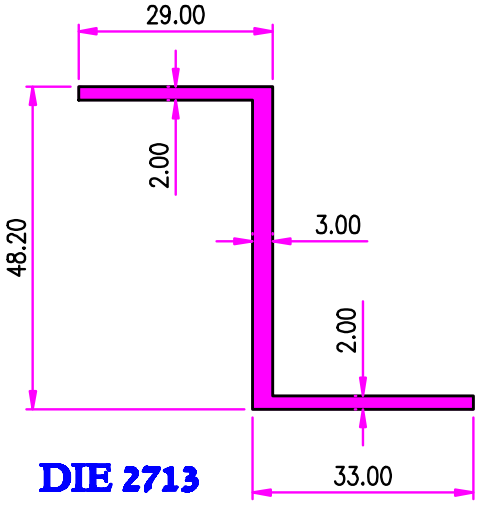
DIE 1566

W : 0.293 KG/M
P : 112.00 MM



DIE 2765

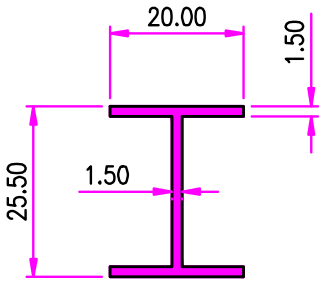
W : 0.677 KG/M
P : 209.36 MM



DIE 2713

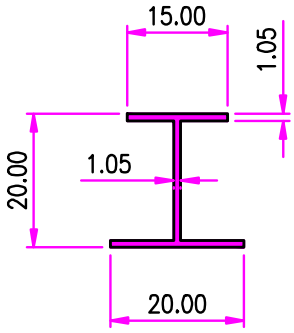
W : 0.695 KG/M
P : 213.76 MM

I BEAM **GROUP : 4C-1**



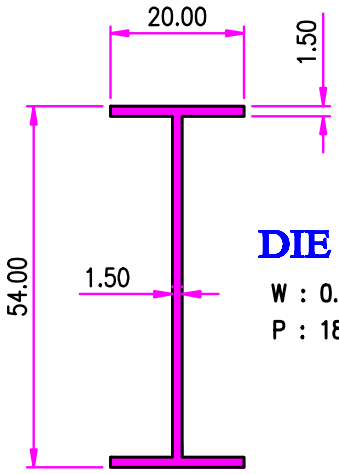
DIE 8655

W : 0.254 KG/M
P : 128.00 MM



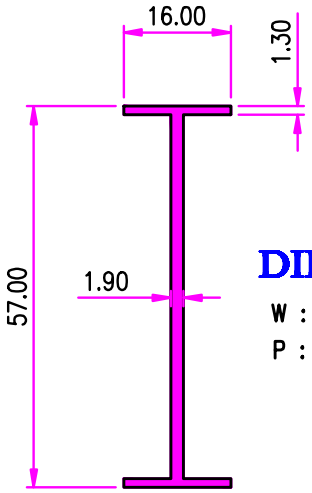
DIE 8593

W : 0.151 KG/M
P : 107.90 MM



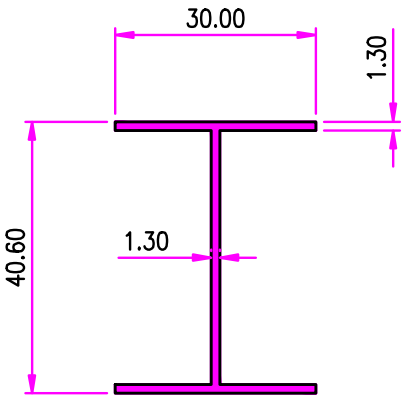
DIE 8656

W : 0.370 KG/M
P : 185.00 MM



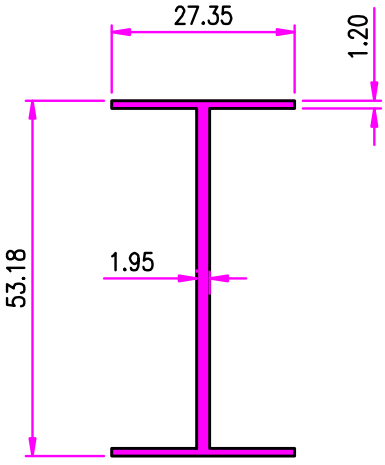
DIE 8645

W : 0.392 KG/M
P : 174.20 MM



DIE 8673

W : 0.345 KG/M
P : 198.60 MM

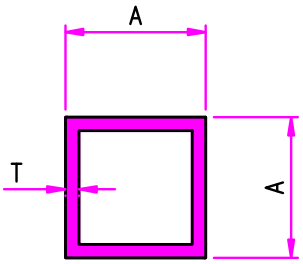


DIE 8690

W : 0.446 KG/M
P : 211.86 MM

SQUARE HOLLOWS

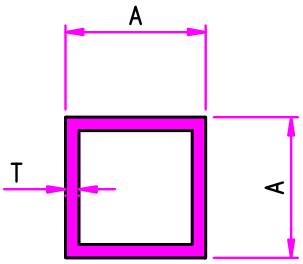
GROUP : 5A-1



SECTION NO.	A m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
182	22.60	0.70	0.166	90.40
191	20.00	0.70	0.146	80.00
214	76.20	1.95	1.569	304.80
216	101.60	1.95	2.106	406.40
372	63.50	3.00	1.967	254.00
373	76.20	6.00	4.566	304.80
459	63.50	6.00	3.740	254.00
460	101.60	6.00	6.218	406.40
771	76.20	1.20	0.976	304.80
2123	76.00	3.00	2.374	304.00
2526	76.20	1.40	1.135	304.80
3201	40.00	0.85	0.361	160.00
3750	63.50	4.50	2.878	254.00
4211	100.00	4.00	4.163	400.00
4223	38.10	1.00	0.402	152.40
4227	18.00	0.90	0.167	72.00
4230	15.88	0.90	0.146	63.52
4231	50.80	2.00	1.058	203.20
4238	50.80	1.10	0.593	203.20
4239	25.40	2.80	0.686	101.60
4240	50.80	1.10	0.593	218.68
4320	100.00	1.80	1.907	396.57
4506	101.60	1.40	1.521	406.40
4507	12.50	1.25	0.152	50.00
4508	12.70	0.90	0.115	50.80
4509	31.70	1.25	0.413	126.80
4510	25.00	1.50	0.382	100.00
4511	25.40	1.00	0.264	101.60
4514	44.45	1.20	0.563	177.80
4517	19.05	1.00	0.196	76.20
4518	31.70	1.00	0.333	126.80

SQUARE HOLLOWS

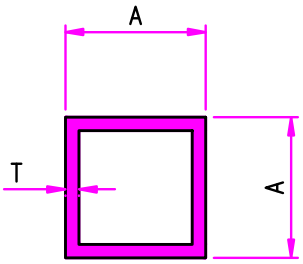
GROUP : 5A-2



SECTION NO.	A m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
4519	25.00	2.00	0.499	100.00
4520	30.00	2.50	0.745	120.00
4520R	30.00	2.20	0.663	120.00
4565	32.00	2.00	0.650	128.00
4568	12.70	1.00	0.127	50.80
4591	9.00	1.00	0.087	36.00
4595	22.20	1.60	0.357	88.80
4598	25.40	0.90	0.240	101.60
4711	50.00	1.70	0.890	200.00
5232	22.00	2.00	0.434	88.00
5318	38.00	1.20	0.479	152.00
5652	38.10	1.20	0.480	152.40
5747	38.10	1.10	0.441	152.40
6337	19.00	1.20	0.232	76.00
6344	25.00	0.80	0.210	100.00
6348	23.50	0.80	0.197	94.00
6414	25.00	0.90	0.235	100.00
6414A	25.00	0.80	0.210	100.00
6418	23.50	0.90	0.220	94.00
6438	40.00	1.50	0.626	160.00
6439	50.00	1.50	0.789	200.00
6696	20.00	2.00	0.390	78.28
7409	70.00	1.50	1.114	280.00
7903	22.00	2.00	0.433	87.14
7905	40.00	3.00	1.203	159.14
8157	15.00	1.10	0.166	60.00
8261	19.05	0.90	0.177	76.20
8356	50.80	2.60	1.358	203.20
8526	44.00	2.49	1.120	176.00
9297	25.00	1.70	0.429	100.00
9298	19.00	1.50	0.285	76.00

SQUARE HOLLOWS

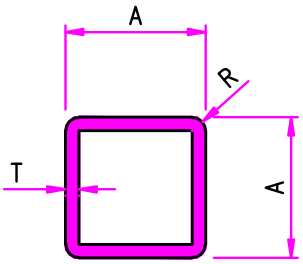
GROUP : 5A-3



SECTION NO.	A m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
9641	15.00	1.50	0.382	60.00
9673	22.00	1.20	0.270	88.00
9913	38.10	1.50	0.595	152.40
9914	50.00	2.00	1.041	200.00
9916	25.40	1.50	0.389	101.60
9917	30.00	1.60	0.493	120.00
9919	60.00	1.50	0.951	240.00

SQUARE HOLLOWS

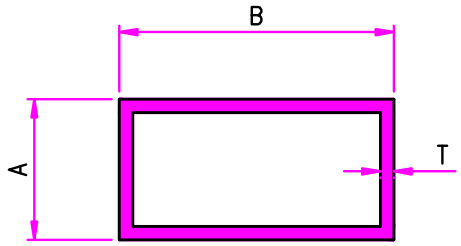
GROUP : 5A-4



SECTION NO.	A m m	R (RADIUS) m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
817	40.00	R2.00	2.00	0.815	156.50
2373	76.00	R1.50	3.00	2.374	301.42
4284	25.40	R2.00	2.50	0.621	98.17
4320	100.00	R2.00	1.80	1.907	396.57
5329	25.00	R2.00	2.40	0.579	96.57
5339	32.00	R2.00	2.50	0.790	124.57
6525	50.80	R6.00	3.00	1.492	192.90
6696	20.00	R1.00	2.00	0.390	78.28
7901	20.00	R1.00	2.00	0.388	78.28
7903	22.00	R0.50	2.00	0.433	87.14
7905	40.00	R0.50	3.00	1.203	159.14
9478	50.00	R2.00	2.00	1.041	196.57
9641	15.00	R1.00	1.50	0.217	58.28
9642	20.00	R2.00	2.00	0.381	76.57
9737	27.00	R2.00	1.50	0.400	103.02
9738	21.40	R2.50	2.00	0.407	81.31
9739	26.00	R2.50	1.40	0.361	99.71
9740	32.00	R4.50	1.60	0.500	120.27
9745	21.40	R2.50	1.60	0.331	81.31
9918	34.00	R1.50	2.00	0.689	133.42

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

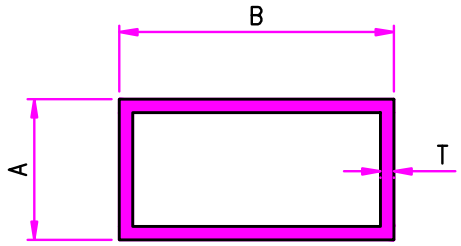
RECTANGULAR HOLLOWS — GROUP : 5B-1



SECTION NO.	A m m	B m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
84	11.00	22.00	0.80	0.136	66.00
85	23.00	34.50	0.80	0.242	115.00
179	50.80	76.20	3.00	1.967	254.00
181	11.00	22.00	0.70	0.120	66.00
192	22.70	34.50	0.70	0.212	114.40
215	76.20	101.60	2.95	2.749	355.60
374	25.40	50.80	3.00	1.141	152.40
375	38.10	76.20	3.00	1.761	226.60
415	25.40	76.20	1.10	0.593	203.20
422	44.45	101.60	1.30	1.011	292.10
426	25.40	50.80	1.00	0.402	152.40
429	44.45	76.20	1.20	0.769	241.30
430	25.40	38.10	1.00	0.333	127.00
461	50.80	101.60	3.00	2.380	304.80
462	38.00	100.00	2.30	1.665	276.00
497	50.80	101.60	1.40	1.135	304.80
518	38.00	125.00	2.30	1.977	326.00
767	50.80	152.40	3.00	3.206	406.40
768	19.05	38.10	1.20	0.356	114.30
770	38.10	101.60	1.20	0.893	279.40
1032	38.00	100.00	2.00	1.453	276.00
1092	25.40	76.20	1.50	0.802	203.20
1641	70.00	200.00	1.80	2.599	540.00
1711	15.00	50.00	1.00	0.341	130.00
2072	160.00	90.00	6.00	8.172	500.00
2082	100.00	76.00	2.30	2.137	352.00
2521	25.40	101.60	1.57	1.054	254.00
2522	44.45	76.20	1.40	0.894	241.30
2886	50.80	101.60	1.80	1.452	304.80
3207	20.00	79.80	1.00	0.530	199.60
3208	20.00	99.80	1.00	0.638	239.60
3209	10.00	20.00	1.10	0.166	60.00

RECTANGULAR HOLLOWS

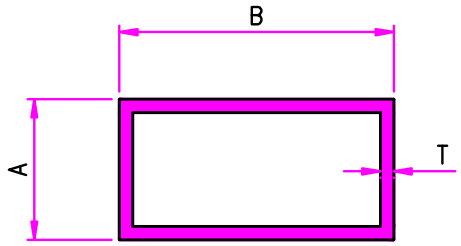
GROUP : 5B-2



SECTION NO.	A m m	B m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
3746	10.00	78.00	1.00	0.468	176.00
4217	25.40	50.80	0.90	0.363	152.40
4218	25.40	38.10	0.90	0.301	127.00
4221	12.70	25.40	0.90	0.177	76.20
4225	25.40	101.60	1.20	0.810	254.00
4232	25.40	50.80	2.00	0.783	152.40
4233	38.10	76.20	1.15	0.698	228.60
4474	16.00	32.00	2.00	0.475	96.00
4512	25.40	50.80	1.20	0.480	152.40
4513	25.40	76.20	1.20	0.645	203.20
4516	12.70	25.40	1.00	0.196	76.20
4547	15.00	25.00	1.50	0.301	80.00
4548	12.70	25.40	1.20	0.232	76.20
4549	22.00	30.00	1.00	0.271	104.00
4556	13.00	35.00	2.00	0.477	96.00
4560	35.00	45.00	2.00	0.824	160.00
4567	35.00	100.00	2.00	1.420	270.00
4569	30.00	50.00	2.50	1.016	160.00
4570	40.00	60.00	2.50	1.287	200.00
4571	19.00	25.40	2.20	0.477	88.80
4572	45.00	100.00	2.50	1.897	290.00
4573	60.00	100.00	5.00	4.065	320.00
4574	25.00	70.00	2.50	1.220	190.00
4576	40.00	120.00	2.50	2.100	320.00
4587	25.40	50.80	1.00	0.402	152.40
4588	44.50	101.50	1.80	1.389	292.00
4589	44.50	76.00	1.80	1.140	241.00
4590	25.40	50.80	1.40	0.557	152.40
4593	25.40	38.10	1.20	0.397	127.00
4594	20.00	38.00	2.00	0.585	116.00
4597	44.50	101.50	2.50	1.912	292.00
4600	50.00	132.00	2.00	1.930	364.00

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

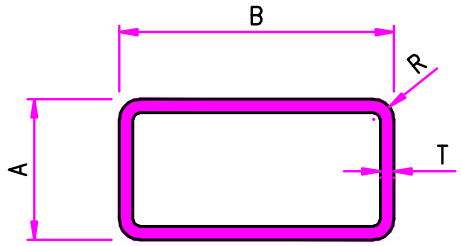
RECTANGULAR HOLLOWS — GROUP : 5B-3



SECTION NO.	A m m	B m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
4603	28.00	40.00	1.20	0.427	136.00
4707	38.10	76.20	1.10	0.668	228.60
4708	44.45	76.20	1.10	0.706	241.30
4712	25.40	101.60	1.00	0.678	254.00
4862	31.75	76.20	1.50	0.853	215.90
5684	12.00	20.00	1.00	0.162	64.00
5738	40.00	110.00	1.60	1.273	300.00
5975	15.00	20.00	1.80	0.306	70.00
6186	20.00	32.00	1.50	0.436	114.00
6340	24.00	36.00	0.80	0.253	120.00
6345	10.00	23.00	0.80	0.136	66.00
6410	24.00	36.00	0.90	0.284	120.00
6415	10.00	23.00	0.90	0.152	66.00
6431	25.40	38.10	0.90	0.301	127.00
7917	48.60	68.60	3.00	1.808	234.40
8139	12.70	19.05	1.00	0.161	63.50
8266	10.80	17.80	0.90	0.130	58.03
8327	50.00	80.00	4.00	2.643	258.28
8748	16.00	41.00	1.40	0.411	216.80
9168	111.00	148.00	4.00	5.442	518.00
9227	50.00	80.00	4.00	2.643	258.28
9592	50.00	101.60	2.80	2.228	304.80
9593	25.40	76.20	2.70	1.408	203.20
9594	25.40	101.60	1.90	1.269	254.00
9597	20.00	40.00	1.20	0.375	120.00
9598	25.40	76.20	2.00	1.058	203.20
9606	15.00	31.80	1.00	0.242	93.60
9621	25.00	50.00	1.10	0.434	150.00
9742	12.70	25.40	1.20	0.232	76.20
9751	25.40	38.10	1.20	0.397	127.00
9904	70.00	155.00	1.75	2.103	450.00
9986	15.00	100.00	1.65	0.999	230.00

RECTANGULAR HOLLOWS

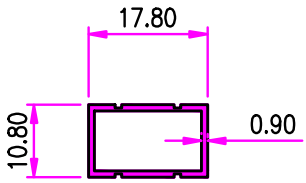
GROUP : 5B-4



SECTION NO.	A m m	B m m	R(RADIUS) m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
4229	13.00	35.00	R5.00	3.00	0.634	87.42
4276	19.00	25.00	R3.00	1.00	0.216	82.85
4794	22.00	30.00	R3.00	1.00	0.259	98.85
4835	22.00	32.00	R2.30	0.80	0.220	104.05
5181	19.00	25.40	R3.00	2.00	0.419	83.65
5183	34.00	42.00	R5.00	1.50	0.564	143.42
5190	20.00	40.00	R5.00	1.60	0.461	111.42
5330	40.00	50.00	R2.00	2.50	1.142	176.57
5331	25.40	50.80	R2.00	2.00	0.773	148.97
5334	18.00	32.00	R2.00	2.50	0.600	96.57
5337	18.00	32.00	R2.00	4.00	0.901	96.57
5345	25.00	45.00	R3.00	2.00	0.697	134.85
5346	10.00	50.00	R2.00	2.00	0.598	116.57
5355	20.00	50.00	R2.00	2.00	0.706	136.57
7895	9.00	22.00	R1.00	2.00	0.290	60.28
7904	20.00	40.00	R1.00	2.00	0.605	118.28
9472	34.00	42.00	R5.00	2.30	0.849	143.42
9861	16.00	28.00	R3.00	2.00	0.415	82.85
9862	16.00	38.50	R3.00	2.00	0.529	103.85

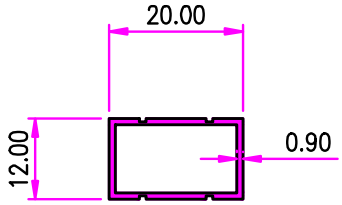
RECTANGULAR HOLLOWS

GROUP : 5B-5



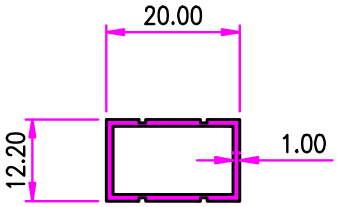
DIE 8266

W : 0.130 KG/M
P : 58.03 MM



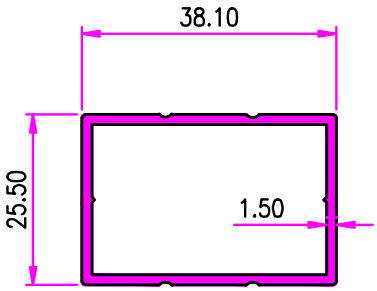
DIE 8251

W : 0.146 KG/M
P : 65.00 MM



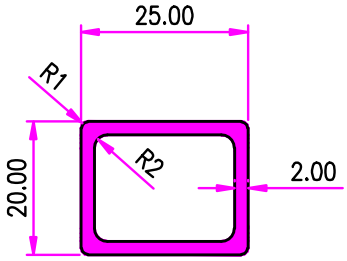
DIE 8241

W : 0.162 KG/M
P : 66.40 MM



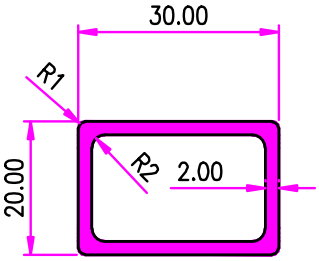
DIE 398

W : 0.488 KG/M
P : 126.81 MM



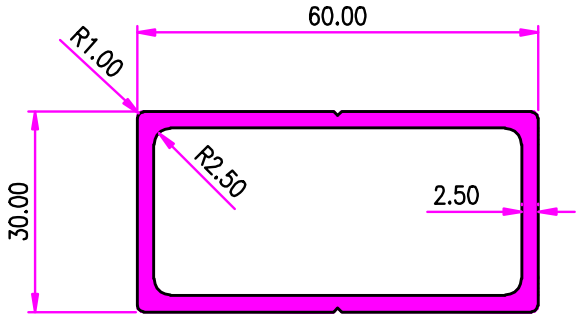
DIE 7894

W : 0.451 KG/M
P : 88.28 MM



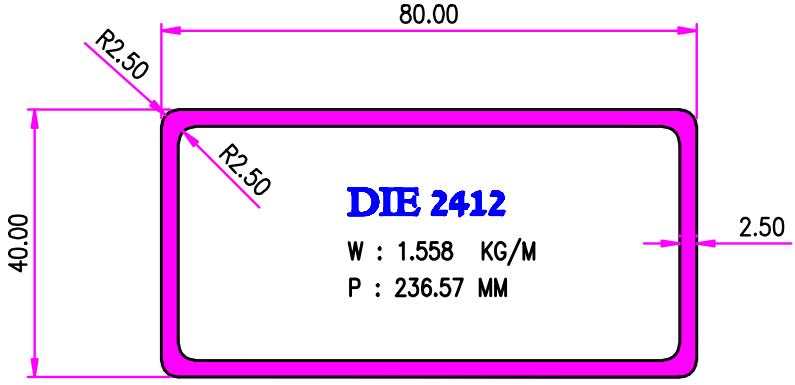
DIE 7893

W : 0.506 KG/M
P : 98.28 MM



DIE 2978

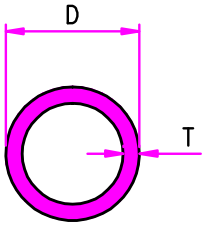
W : 1.163 KG/M
P : 178.78 MM



DIE 2412

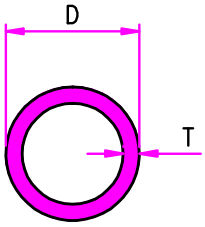
W : 1.558 KG/M
P : 236.57 MM

TUBINGS **GROUP : 5C-1**



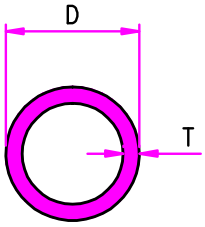
SECTION NO.	D m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
394	44.45	4.50	1.531	139.64
396	88.90	12.70	8.239	279.79
491	190.00	10.00	15.325	596.90
492	203.20	12.00	19.534	638.37
493	203.20	6.00	10.073	638.37
843	19.05	3.00	0.410	59.85
844	50.80	4.50	1.774	159.59
845	88.90	3.00	2.194	279.29
846	127.00	6.00	6.181	398.99
847	152.40	6.00	7.478	478.78
848	53.00	7.25	2.824	166.50
849	76.20	6.35	3.776	239.39
850	168.27	7.00	9.611	528.64
852	101.60	12.00	9.154	319.19
853	101.60	25.40	16.480	319.19
857	50.80	3.00	1.221	159.59
858	76.20	3.00	1.870	239.39
859	38.10	6.00	1.640	119.70
860	50.80	6.00	2.288	159.59
861	101.60	6.00	4.883	319.19
862	45.00	5.00	1.683	141.37
863	50.00	2.00	0.817	157.08
1123	11.50	0.90	0.081	36.13
1253	126.80	2.50	2.646	398.35
2543	25.40	3.00	0.572	79.80
2544	31.75	3.00	0.734	99.75
2545	44.45	3.00	1.059	139.64
2546	50.80	2.90	1.183	159.59
2547	63.50	4.50	2.260	199.49
2548	38.00	3.00	0.894	119.38
2551	24.60	0.90	0.184	77.28

TUBINGS **GROUP : 5C-2**



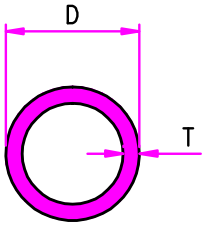
SECTION NO.	D m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
2895	48.80	2.60	1.023	153.31
2960	12.50	2.00	0.179	39.27
2975	9.50	1.50	0.102	29.85
2976	48.00	3.00	1.164	153.67
3082	12.00	1.50	0.134	37.70
3084	25.00	1.50	0.300	78.54
3555	40.00	1.40	0.460	125.60
3797	8.00	1.25	0.072	25.13
4005	9.52	0.90	0.066	29.92
4007	9.00	1.00	0.068	28.27
4008	9.50	1.00	0.072	29.85
4009	12.70	1.00	0.100	73.51
4010	19.05	2.00	0.290	59.85
4011	16.00	1.20	0.151	50.27
4013	16.00	1.50	0.185	50.27
4014	19.05	0.85	0.132	59.85
4015	19.05	1.00	0.154	59.85
4016	22.22	1.50	0.264	130.22
4017	38.10	3.00	0.897	220.54
4018	25.40	2.90	0.556	79.80
4019	26.70	5.00	0.924	136.34
4020	25.40	3.175	0.601	79.80
4021	25.40	4.65	0.823	130.10
4022	80.00	7.25	4.493	457.10
4023	15.00	1.60	0.197	47.14
4024	31.75	1.27	0.329	99.75
4025	50.80	1.30	0.630	159.59
4026	47.80	1.50	0.587	150.17
4027	15.88	1.00	0.127	49.89
4031	21.40	2.64	0.422	117.87
4032	33.80	3.25	0.845	191.96

TUBINGS **GROUP : 5C-3**



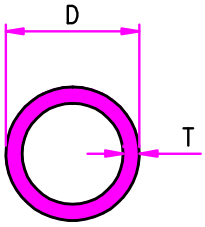
SECTION NO.	D m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
4033	48.30	3.25	1.247	151.74
4034	19.00	4.00	0.511	94.25
4035	23.00	4.50	0.709	116.24
4037	20.60	4.60	0.627	100.53
4038	14.30	3.00	0.289	71.00
4039	38.10	8.05	2.060	188.82
4040	30.20	6.975	1.379	94.88
4041	27.00	2.50	0.521	153.94
4042	27.87	6.235	1.148	135.81
4043	16.00	3.05	0.354	50.27
4044	25.50	4.50	0.805	80.11
4045	32.60	5.60	1.287	102.42
4046	17.75	4.00	0.468	55.76
4047	12.00	2.50	0.202	37.70
4048	23.10	4.80	0.748	72.57
4049	40.00	2.50	0.798	125.66
4050	152.40	3.00	3.816	478.78
4051	101.60	2.00	1.696	319.19
4052	12.00	2.25	0.187	37.70
4053	26.00	4.75	0.859	81.68
4054	28.50	6.00	1.149	89.54
4055	25.40	1.00	0.208	79.80
4056	22.23	0.95	0.172	69.82
4057	10.60	2.50	0.172	33.30
4058	21.70	1.30	0.226	68.17
4059	40.40	6.20	1.805	126.62
4064	14.00	1.40	0.150	43.98
4069	120.00	10.00	9.374	376.99
4071	101.60	1.60	1.362	319.19
4072	13.30	1.00	0.105	41.78
4076	55.00	2.60	1.202	172.79

TUBINGS **GROUP : 5C-4**



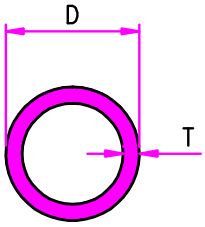
SECTION NO.	D m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
4079	32.00	1.24	0.325	100.53
4080	25.40	1.20	0.246	79.80
4081	101.60	1.70	319.19	1.446
4082	38.70	1.70	0.536	121.60
4083	20.00	0.90	0.146	62.83
4084	166.40	7.20	10.664	522.50
4086	18.00	1.50	0.211	56.55
4087	20.00	1.50	0.236	62.83
4088	9.60	1.925	0.126	30.16
4092	88.50	10.25	6.835	278.03
4093	120.50	10.25	9.631	378.56
4095	19.05	1.775	0.261	59.85
4096	40.00	1.80	0.585	125.66
4097	45.00	1.80	0.662	141.37
4098	31.80	1.80	0.460	99.90
4099	19.00	1.80	0.264	59.69
4100R	22.00	2.00	0.341	69.12
4101A	41.00	4.00	1.260	128.81
4102	178.00	26.50	34.180	559.20
4103	153.00	26.50	28.540	480.66
4104	26.00	5.20	0.920	81.68
4108	90.60	4.00	2.950	284.63
4109	77.70	3.85	2.421	244.10
4111	42.50	2.60	0.883	133.52
4112	28.00	8.10	1.372	87.96
4119	25.00	1.00	0.204	78.54
4120	43.00	2.50	0.862	135.09
4121	73.50	9.25	5.059	230.91
4149	19.05	0.90	0.139	59.85
4153	14.00	2.60	0.252	43.98
4154	19.10	1.65	0.245	60.00

TUBINGS **GROUP : 5C-5**



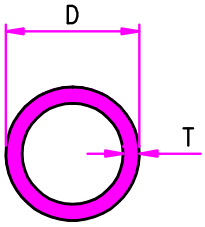
SECTION NO.	D m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
4154	19.10	1.65	0.245	60.00
4155	16.00	1.20	0.174	50.27
4156	15.00	1.60	0.183	47.12
4157	21.00	4.70	0.604	60.27
4265	50.00	4.00	1.567	157.08
4266	40.00	3.50	1.266	144.51
4267	38.00	2.00	0.613	119.38
4273	55.50	2.00	0.911	174.36
4636	8.50	0.80	0.052	26.70
4665	21.40	4.00	0.593	67.23
4820	25.40	1.50	0.305	79.80
4821	19.00	1.50	0.223	59.69
5147	29.00	1.70	0.395	91.11
5175	41.60	4.00	1.280	130.69
5178	25.40	2.00	0.398	79.80
5182	50.80	8.60	3.090	159.59
5191	28.60	1.40	0.324	89.85
5240	14.00	1.00	0.111	43.98
5352	12.00	2.00	0.170	37.70
5353	16.00	2.00	0.238	50.27
5390	14.00	0.80	0.090	43.98
5403	19.05	1.60	0.238	59.85
5404	22.20	3.00	0.490	69.74
5601	24.00	1.35	0.260	75.40
5602	26.00	1.35	0.283	81.68
5632	15.80	0.90	0.114	49.64
5765	95.00	2.50	1.969	298.45
5768	43.00	2.50	0.846	138.10
5778	30.00	10.85	1.769	94.25
5825	37.15	2.95	0.859	116.71
5939	29.00	2.00	0.460	91.11

TUBINGS **GROUP : 5C-6**



SECTION NO.	D m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
5940	25.40	1.70	0.538	29.80
5941	22.20	1.80	0.312	69.74
5942	15.00	1.50	0.172	47.12
5943	12.70	2.00	0.182	39.90
5944	9.53	2.00	0.128	29.94
6049	25.95	1.35	0.283	81.52
6321	100.00	5.00	4.044	314.16
6322	80.00	10.00	5.960	251.33
6326	180.00	8.00	11.714	565.49
6327	120.00	12.00	11.033	376.99
6328	160.00	5.00	6.598	502.65
6329	100.00	10.00	7.662	314.16
6330	68.90	6.00	3.213	216.46
6384	16.00	3.00	0.332	50.27
6437	87.20	5.50	3.826	273.95
6485	63.50	2.00	1.047	199.49
6487	44.00	3.00	1.047	138.23
6655	32.00	2.00	0.511	100.53
6657	39.00	2.00	0.630	122.52
6756	28.00	1.20	0.274	87.96
6833	15.80	1.00	0.126	49.64
7019	80.00	1.80	1.198	251.33
7450	25.00	4.50	0.785	78.54
7451	18.50	3.75	0.503	61.26
7529R	96.73	5.00	3.862	300.74
8335	29.35	1.40	0.331	92.21
8412	30.00	2.00	0.477	94.25
8463	27.00	5.50	1.005	84.82
8697	76.00	1.80	1.197	238.36
8919	38.10	1.50	0.467	119.69
8920	33.00	1.50	0.402	103.67

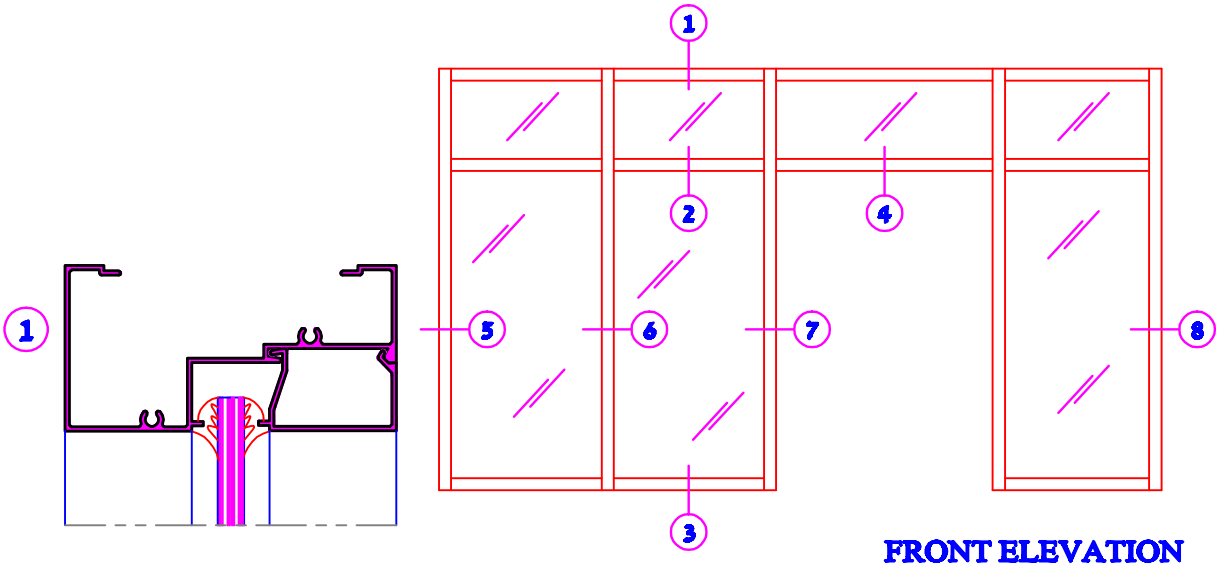
TUBINGS **GROUP : 5C-7**



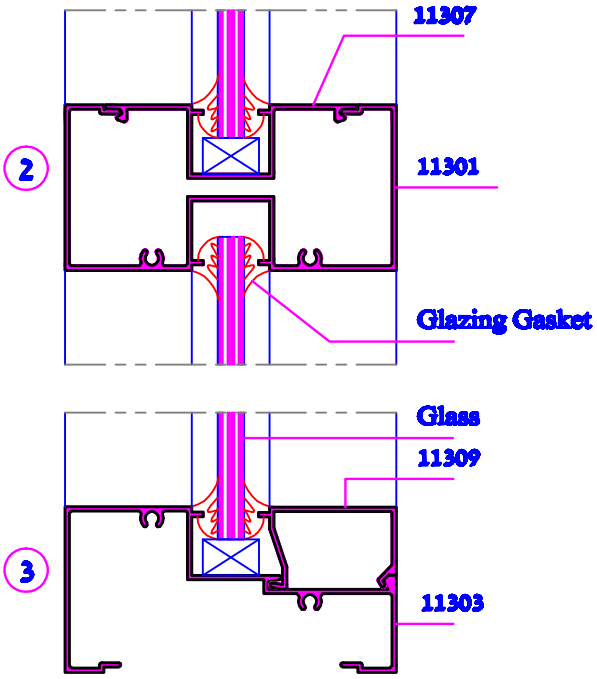
SECTION NO.	D m m	T m m	WEIGHT KG/M	OUT PERIMETER m m
8937	85.70	6.35	4.290	269.23
9212	34.00	1.00	0.281	106.81
9296	25.00	1.70	0.337	78.54
9471	33.00	1.80	0.478	103.67
9535	120.65	6.35	6.179	379.03
9551	42.00	1.50	0.517	131.95
9553	25.00	2.00	0.398	79.80
9554	31.75	2.00	0.507	79.80
9557	29.40	2.00	0.467	92.36
9558	35.75	2.00	0.575	112.31
9559	37.00	1.50	0.453	116.24
9560	43.00	1.50	0.530	135.09
9596	15.88	2.80	0.311	49.89
9672	19.00	1.20	0.182	59.69
9743	15.88	1.50	0.184	49.89
9744	31.75	1.50	0.386	99.75
9752	19.00	1.50	0.223	59.69
9753	22.00	1.50	0.262	69.12
9754	25.40	1.50	0.305	79.80
9755	43.00	2.90	0.990	135.09
9756	9.50	2.00	0.128	29.85
9757	6.50	1.65	0.068	20.42
9826	7.50	1.00	0.055	23.56
9826R	7.50	1.20	0.064	23.56
9838	126.80	3.00	3.162	398.35
9851	44.50	1.25	0.460	139.80
9852	70.00	1.50	0.875	219.91
9944	28.20	3.00	0.644	88.59
9945	22.15	3.075	0.499	69.59
10307	16.00	3.50	0.372	50.27
10324	21.00	4.00	0.579	66.97

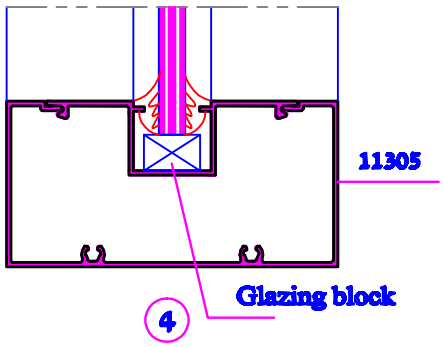
PT.ALEXINDO
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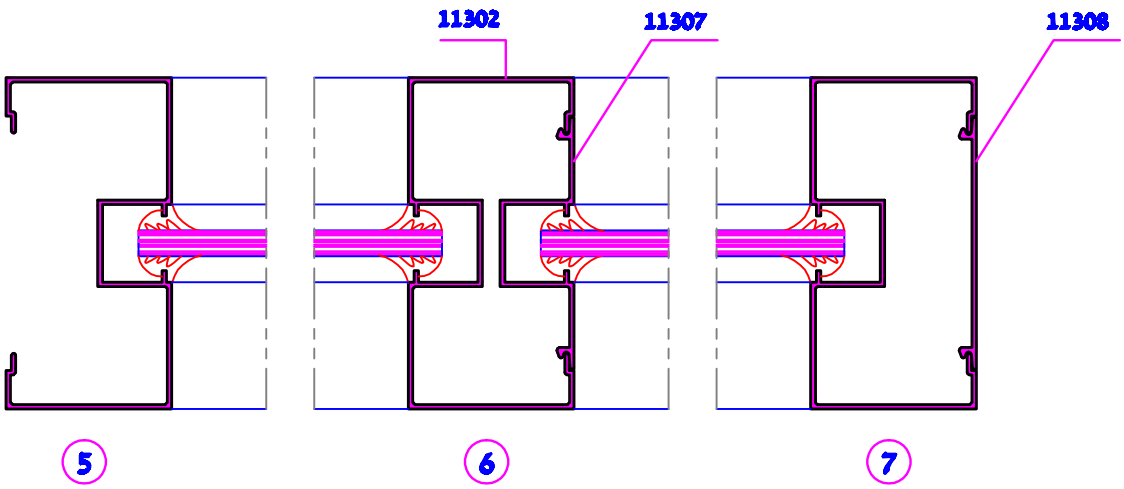
SHOP FRONT 3" x 1 1/2" ASSEMBLY DETAIL — GROUP : 6A-1



FRONT ELEVATION



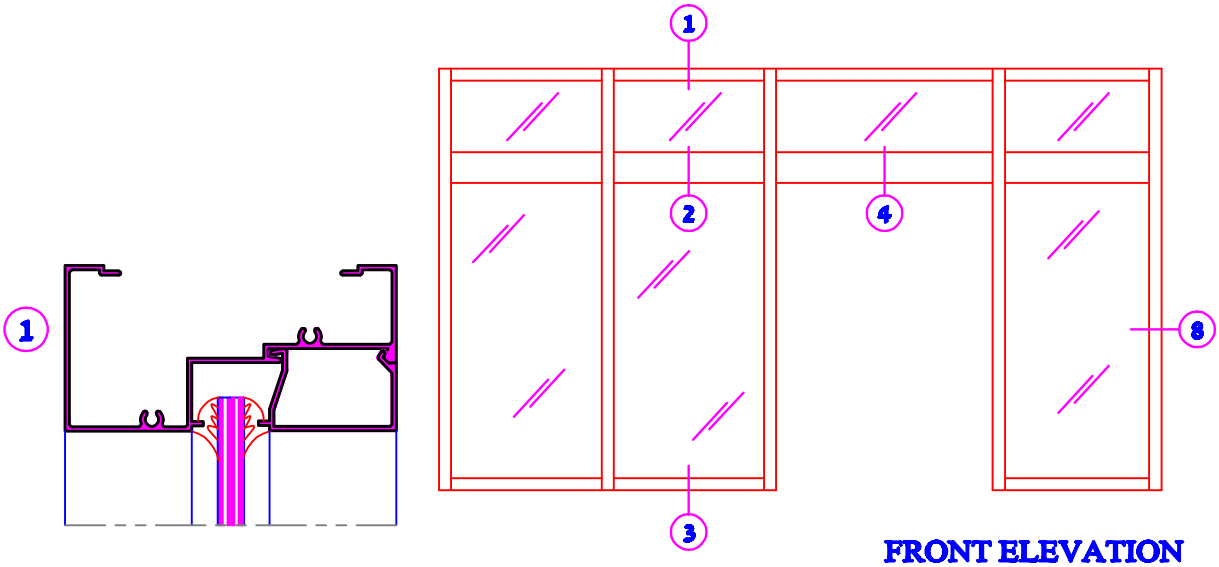




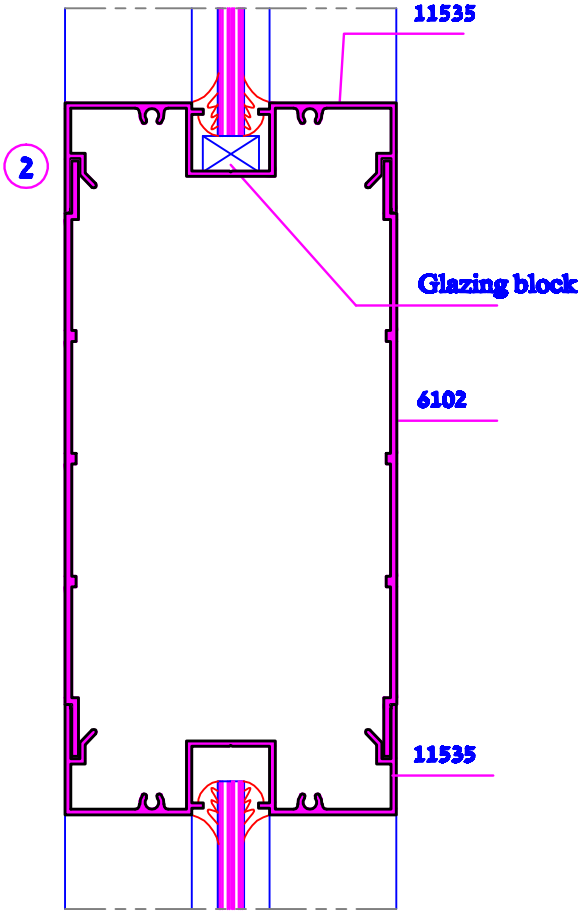
PT.ALEXINDO
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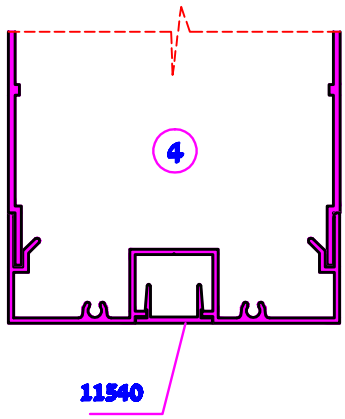
SHOP FRONT 3" x 1 1/2" ASSEMBLY DETAIL

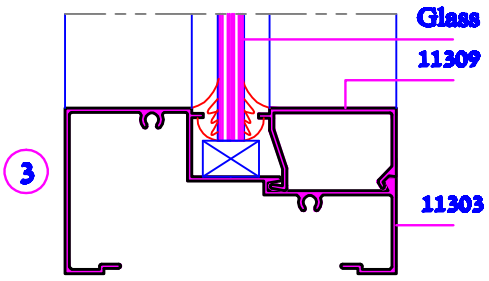
GROUP : 6A-2

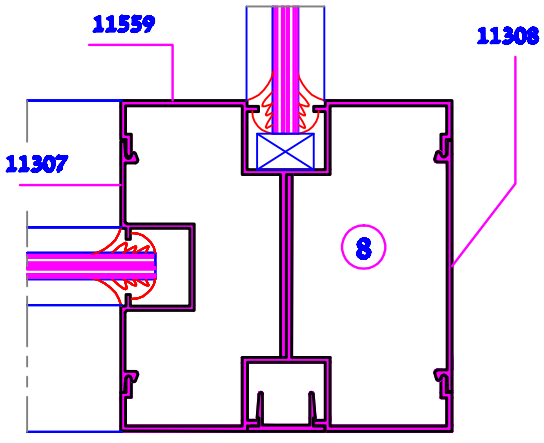


FRONT ELEVATION



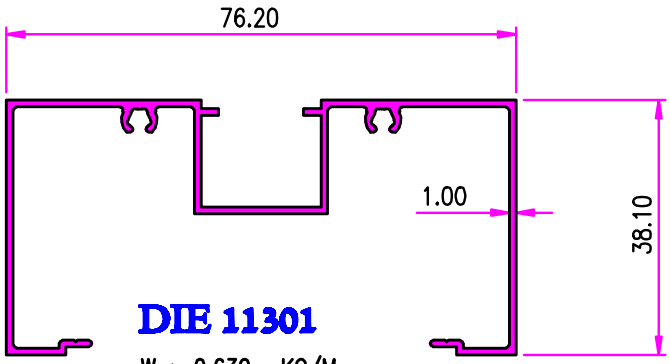






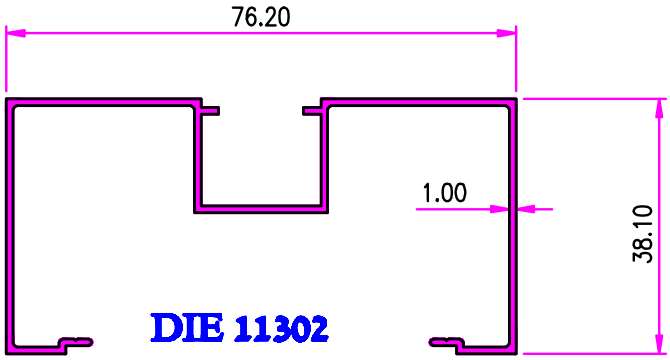
HOOK SECTION

SHOP FRONT 3"x 11/2"x 1.00 MM **GROUP : 6B-1**



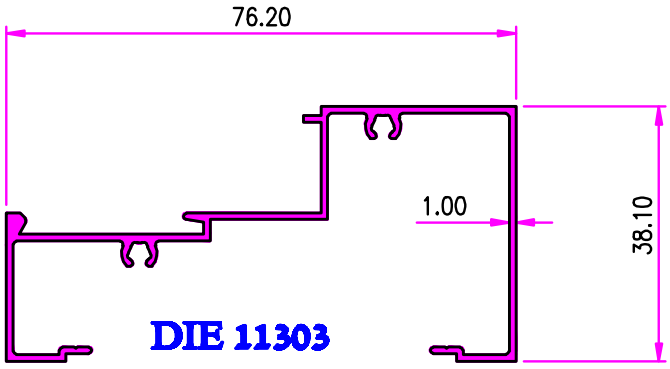
DIE 11301

W : 0.630 KG/M
P : 453.47 MM



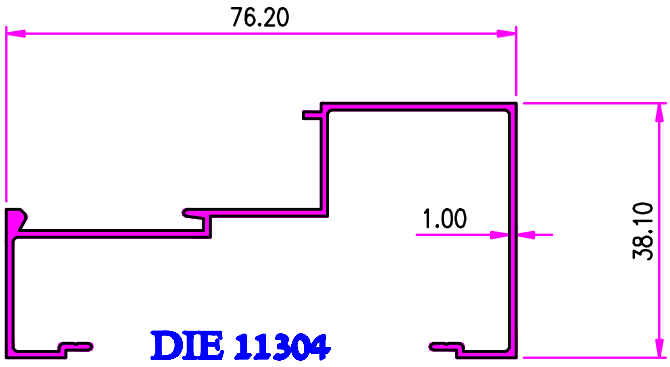
DIE 11302

W : 0.579 KG/M
P : 426.90 MM



DIE 11303

W : 0.568 KG/M
P : 397.02 MM

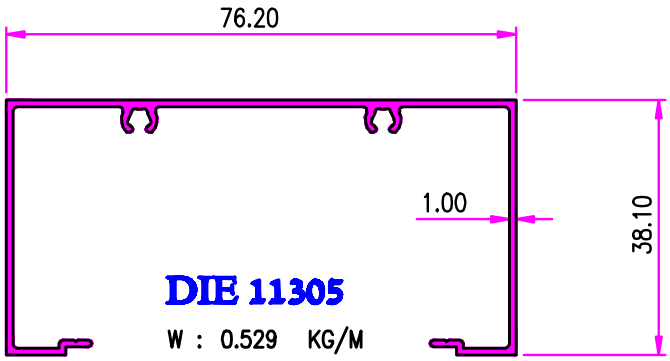


DIE 11304

W : 0.517 KG/M
P : 370.50 MM

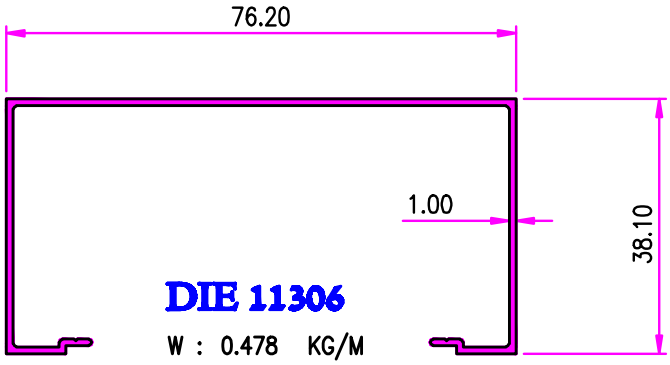
PT.ALEXINDO
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SHOP FRONT 3"x 11/2"x 1.00 MM **GROUP : 6B-2**



DIE 11305

W : 0.529 KG/M
P : 379.49 MM

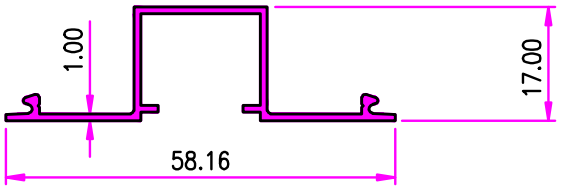


DIE 11306

W : 0.478 KG/M
P : 352.93 MM

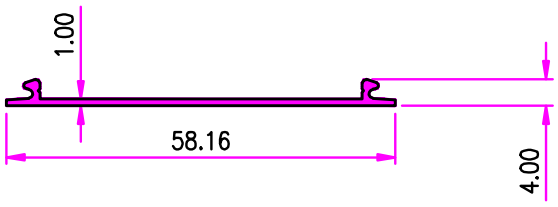
DIE 11307

W : 0.285 KG/M
P : 206.58 MM



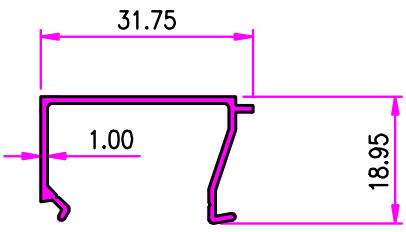
DIE 11308

W : 0.184 KG/M
P : 132.61 MM



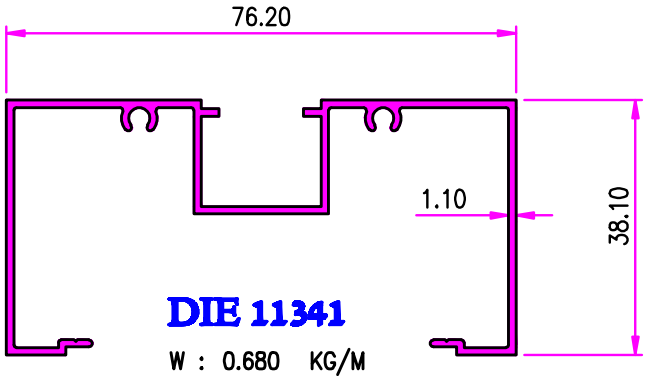
DIE 11309

W : 0.200 KG/M
P : 146.34 MM



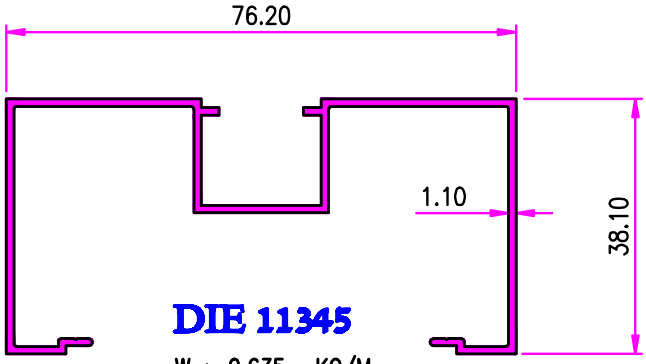
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 3"x 11/2"x 1.10 MM **GROUP : 6C-1**



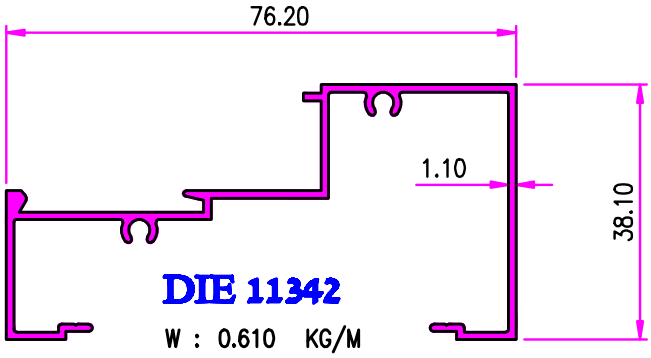
DIE 11341

W : 0.680 KG/M
P : 350.88 MM



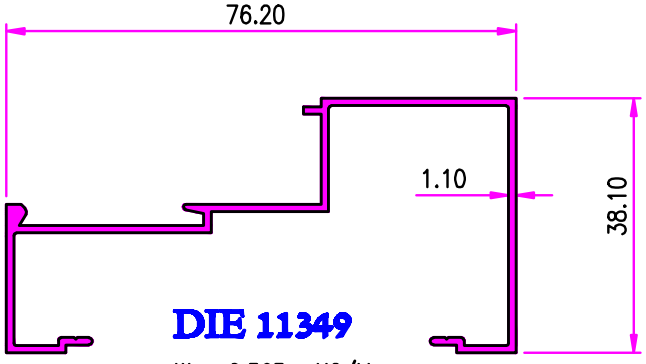
DIE 11345

W : 0.635 KG/M
P : 426.45 MM



DIE 11342

W : 0.610 KG/M
P : 394.40 MM

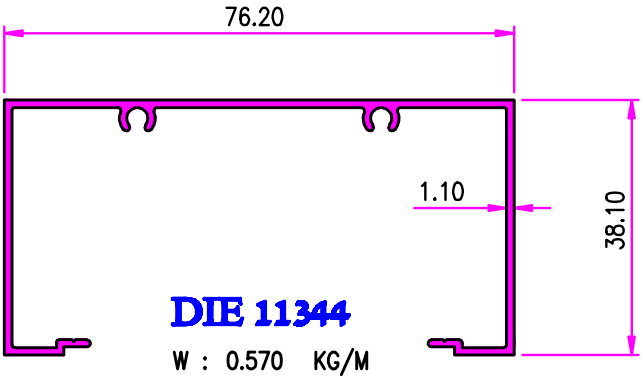


DIE 11349

W : 0.565 KG/M
P : 369.97 MM

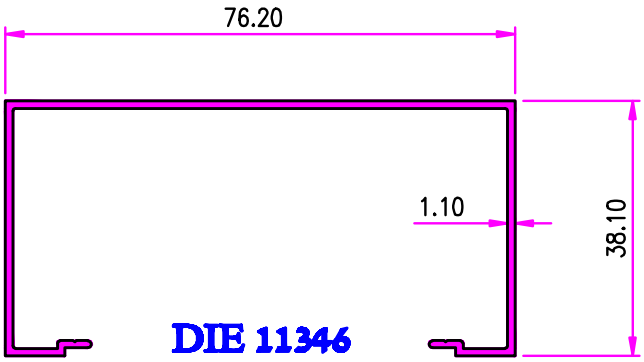
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 3"x 11/2"x 1.10 MM **GROUP : 6C-2**



DIE 11344

W : 0.570 KG/M
P : 377.22 MM

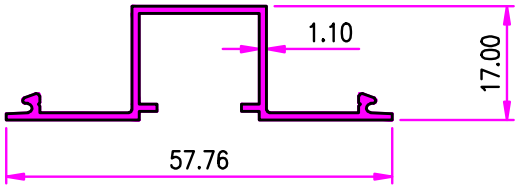


DIE 11346

W : 0.525 KG/M
P : 352.79 MM

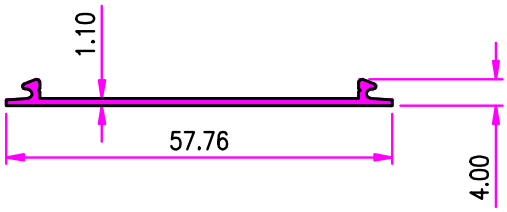
DIE 11347

W : 0.308 KG/M
P : 205.42 MM



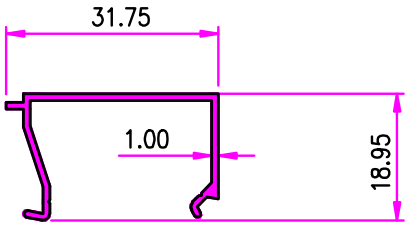
DIE 11348

W : 0.197 KG/M
P : 131.76 MM



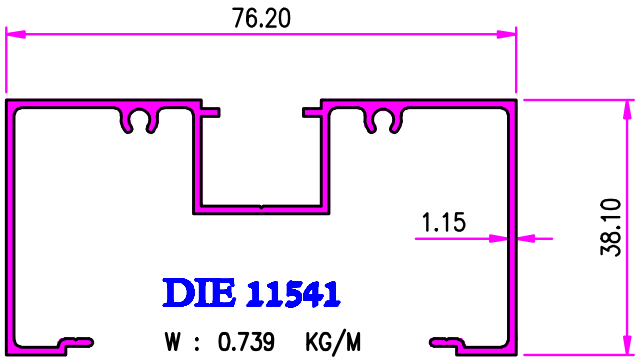
DIE 11343

W : 0.204 KG/M
P : 149.17 MM



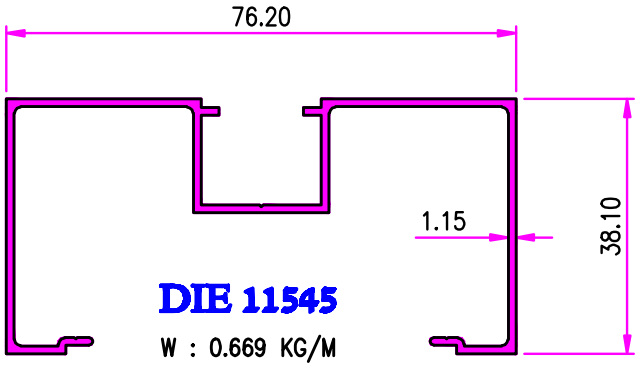
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 3"x 11/2"x 1.15 MM **GROUP : 6D-1**



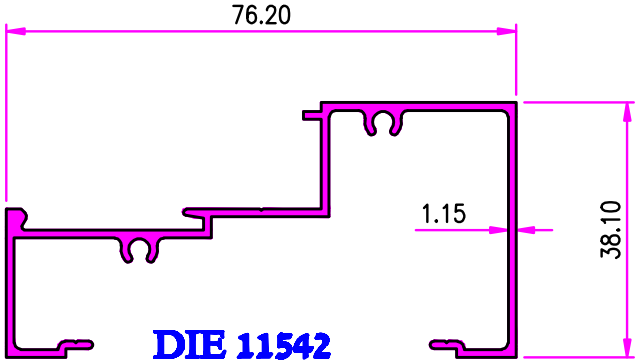
DIE 11541

W : 0.739 KG/M
P : 456.94 MM



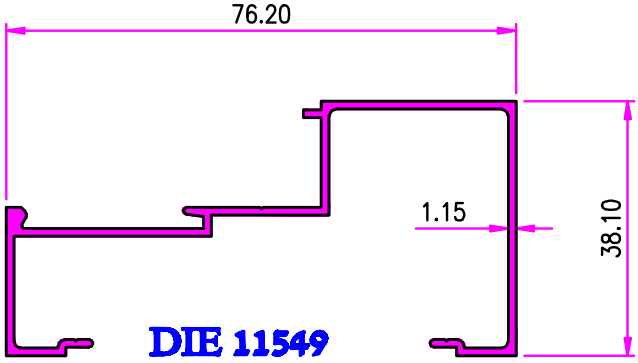
DIE 11545

W : 0.669 KG/M
P : 428.48 MM



DIE 11542

W : 0.663 KG/M
P : 396.68 MM

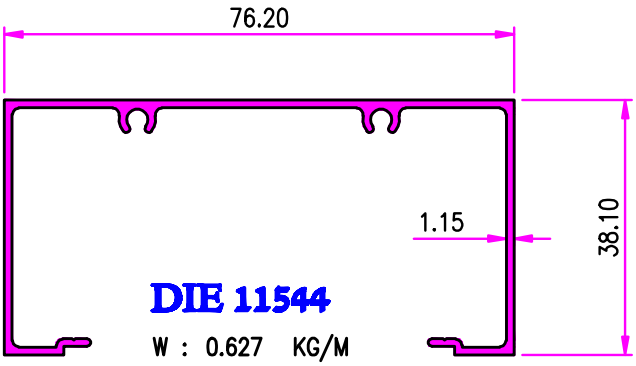


DIE 11549

W : 0.590 KG/M
P : 369.00 MM

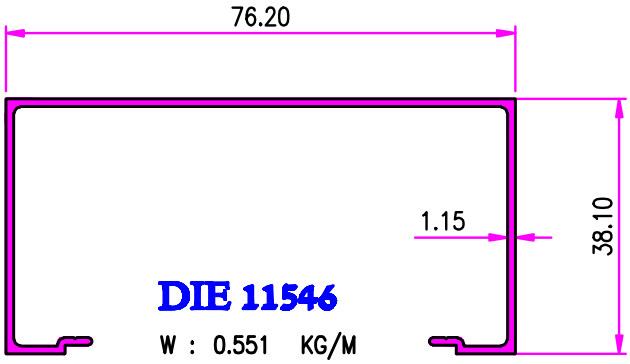
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 3"x 11/2"x 1.15 MM **GROUP : 6D-2**



DIE 11544

W : 0.627 KG/M
P : 383.00 MM

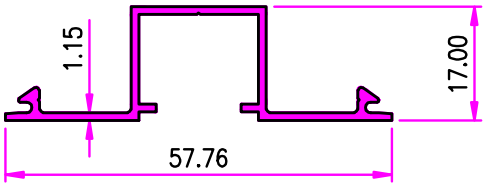


DIE 11546

W : 0.551 KG/M
P : 354.48 MM

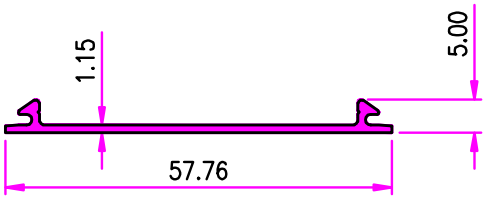
DIE 11547

W : 0.346 KG/M
P : 200.50 MM



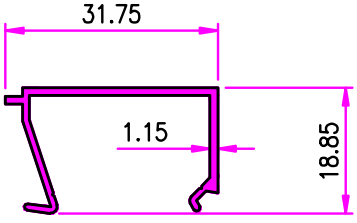
DIE 11548

W : 0.225 KG/M
P : 126.50 MM



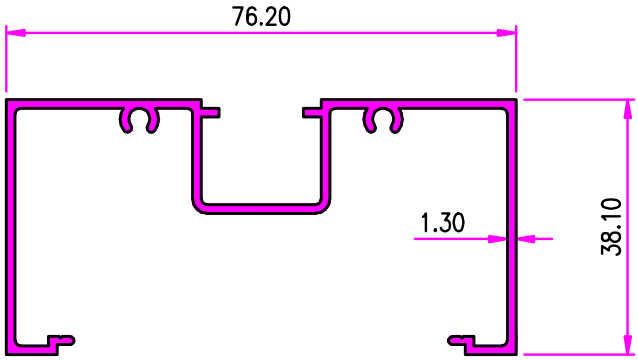
DIE 11543

W : 0.232 KG/M
P : 150.25 MM



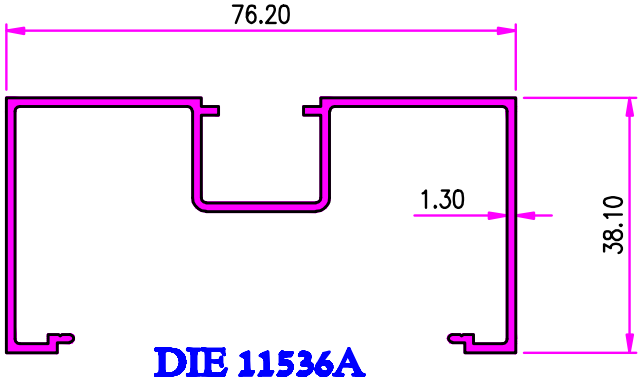
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 3"x 11/2"x 1.30 MM **GROUP : 6E-1**



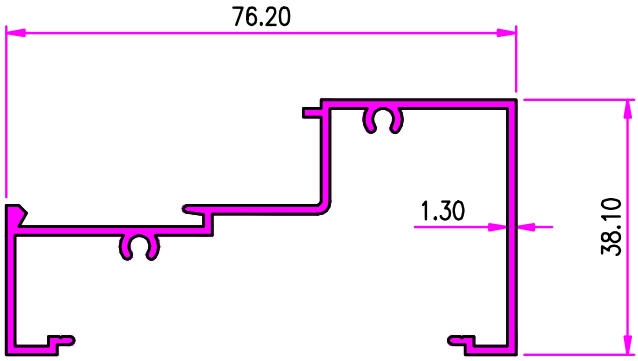
DIE 11536

W : 0.801 KG/M
P : 431.00 MM



DIE 11536A

W : 0.725 KG/M
P : 402.50 MM

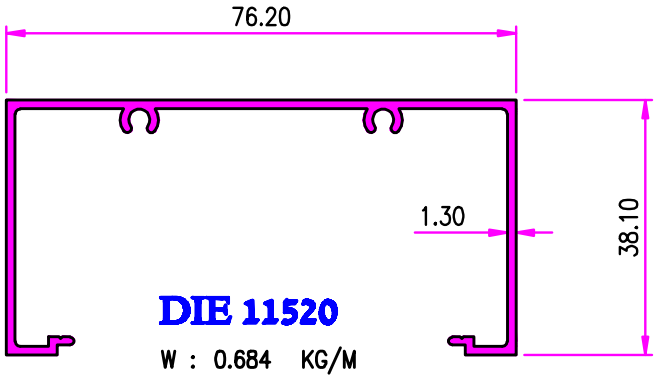


DIE 11537

W : 0.717 KG/M
P : 365.00 MM

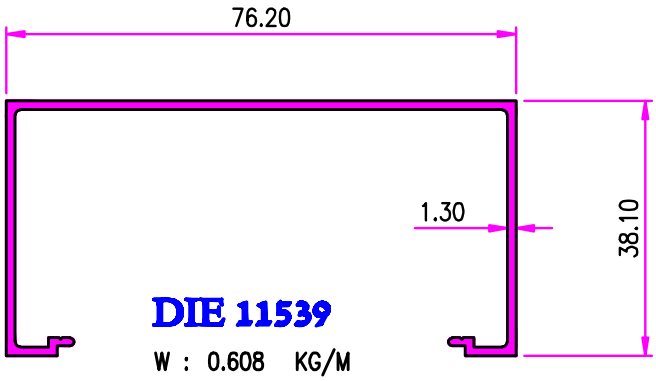
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 3"x 11/2"x 1.30 MM **GROUP : 6E-2**



DIE 11520

W : 0.684 KG/M
P : 377.00 MM

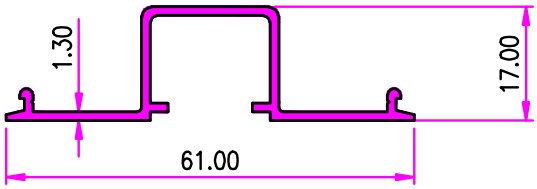


DIE 11539

W : 0.608 KG/M
P : 348.50 MM

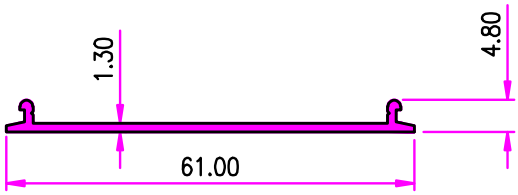
DIE 11510

W : 0.368 KG/M
P : 208.65 MM



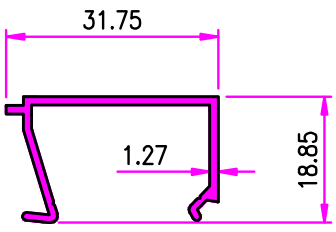
DIE 11511

W : 0.246 KG/M
P : 139.00 MM



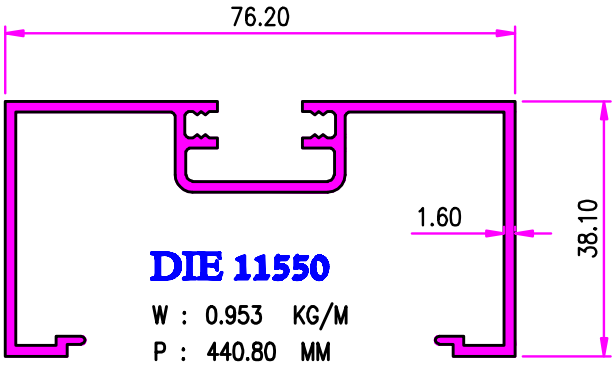
DIE 11538

W : 0.247 KG/M
P : 148.16 MM

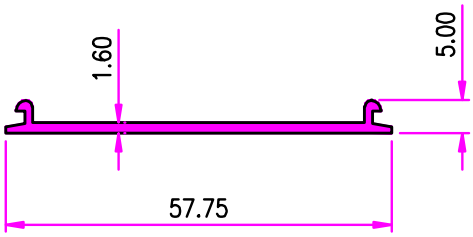


PT.ALEXINDO
(Aluminium Extrusions Indonesia)

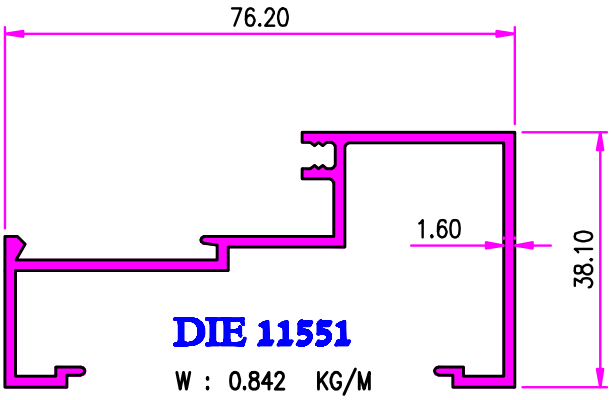
SHOP FRONT 3"x 11/2"x 1.60 MM — GROUP : 6F-1



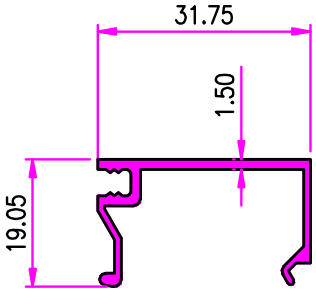
DIE 11550
W : 0.953 KG/M
P : 440.80 MM



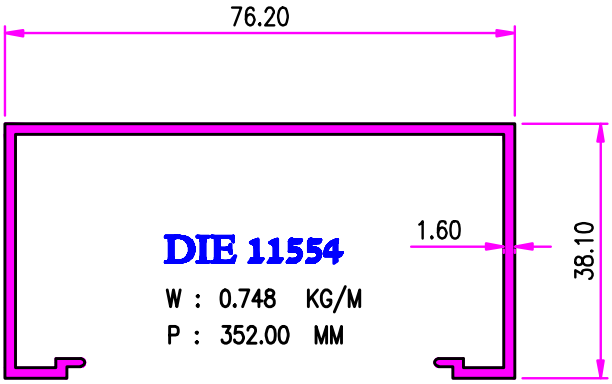
DIE 11555
W : 0.296 KG/M
P : 141.50 MM



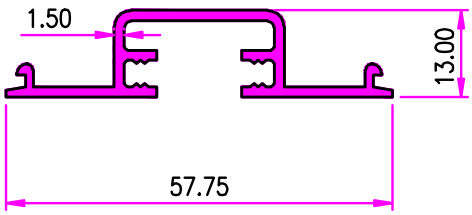
DIE 11551
W : 0.842 KG/M
P : 385.00 MM



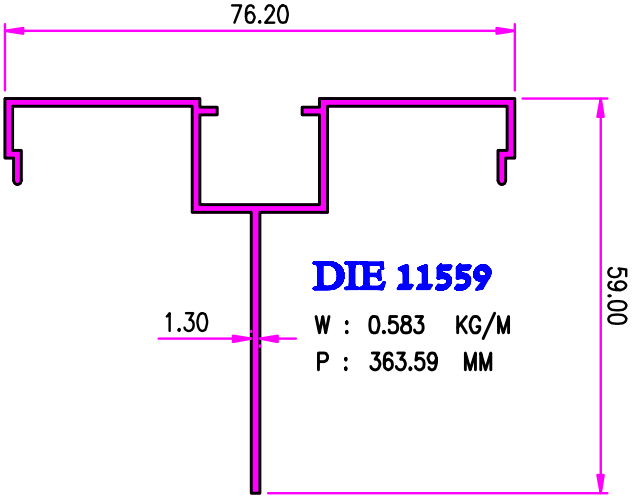
DIE 11552
W : 0.325 KG/M
P : 156.00 MM



DIE 11554
W : 0.748 KG/M
P : 352.00 MM

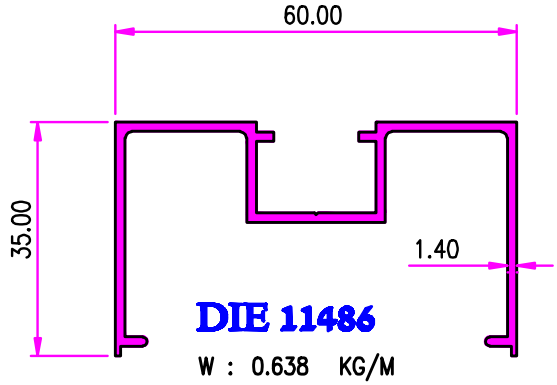


DIE 11553
W : 0.501 KG/M
P : 265.00 MM



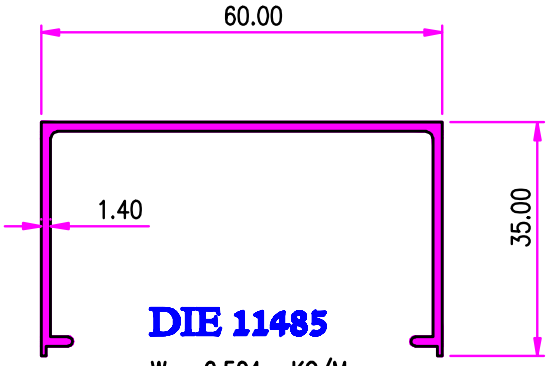
DIE 11559
W : 0.583 KG/M
P : 363.59 MM

SHOP FRONT 60mmx35mm **GROUP : 6G-1**



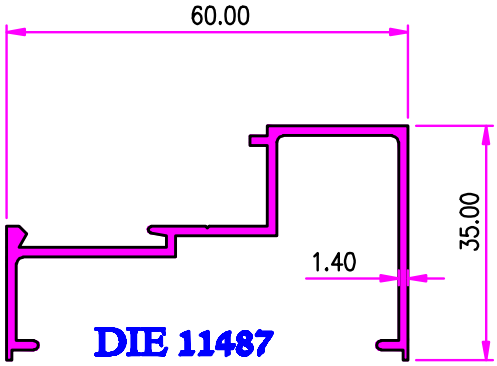
DIE 11486

W : 0.638 KG/M
P : 340.48 MM



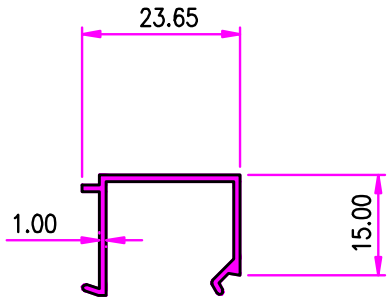
DIE 11485

W : 0.504 KG/M
P : 270.08 MM



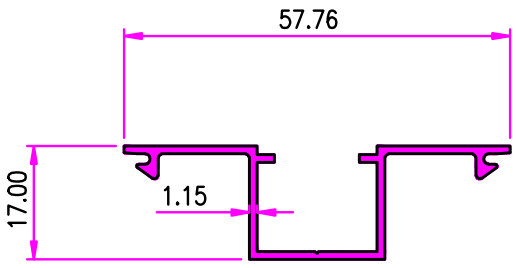
DIE 11487

W : 0.543 KG/M
P : 285.62 MM



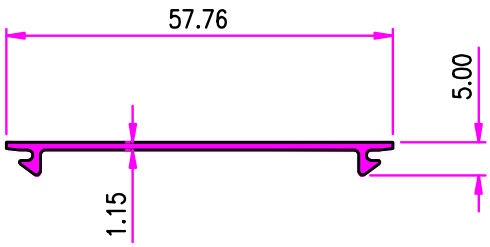
DIE 11488

W : 0.173 KG/M
P : 130.60 MM



DIE 11547

W : 0.346 KG/M
P : 200.50 MM

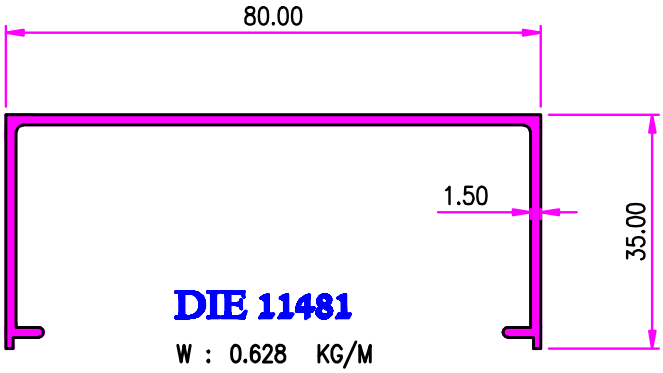


DIE 11548

W : 0.225 KG/M
P : 126.50 MM

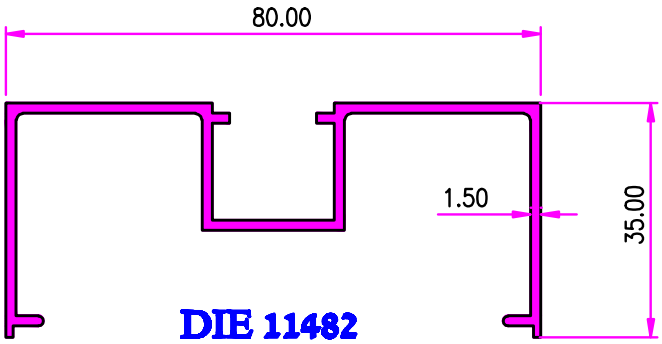
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 80mmx35mm **GROUP : 6H-1**



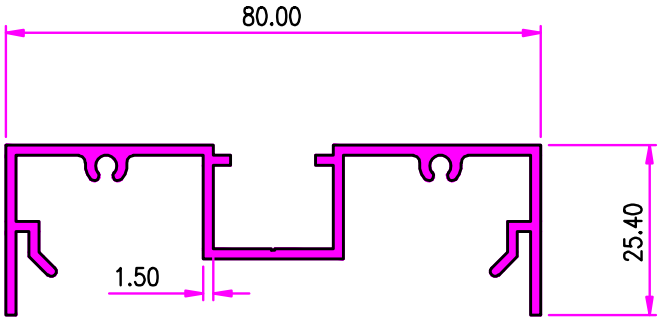
DIE 11481

W : 0.628 KG/M
P : 313.60 MM



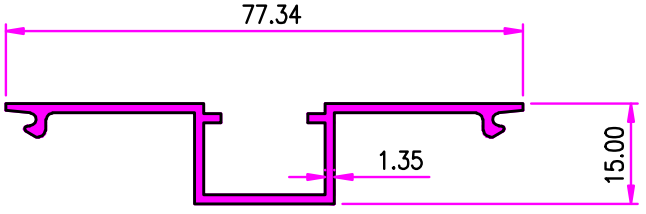
DIE 11482

W : 0.795 KG/M
P : 397.00 MM



DIE 11483

W : 0.825 KG/M
P : 410.00 MM

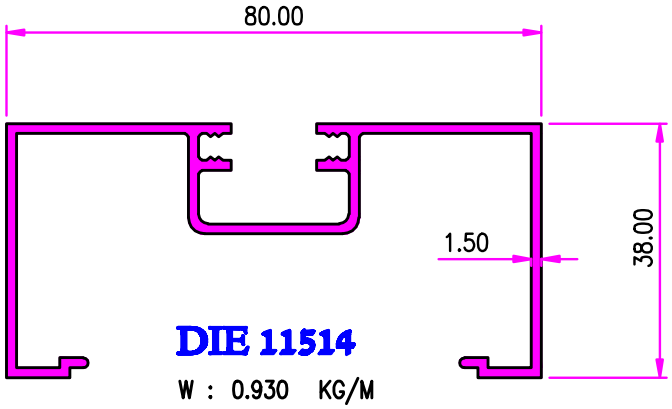


DIE 11484

W : 0.447 KG/M
P : 249.00 MM

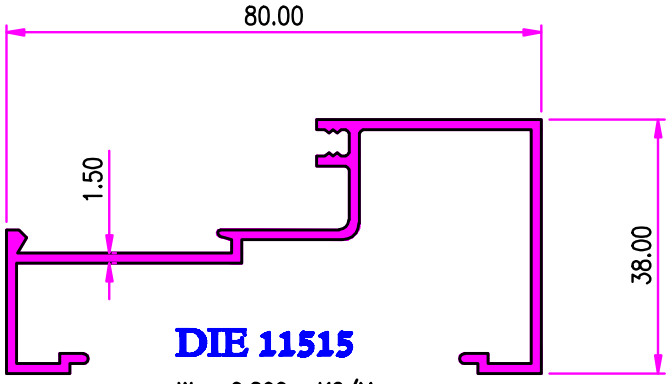
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 80mmX38mm **GROUP : 6I-1**



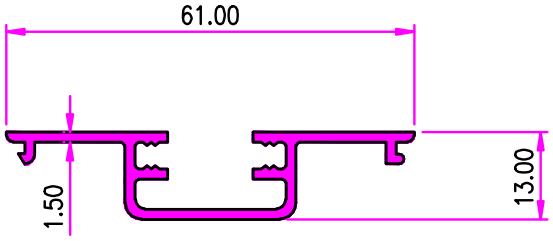
DIE 11514

W : 0.930 KG/M
P : 445.00 MM



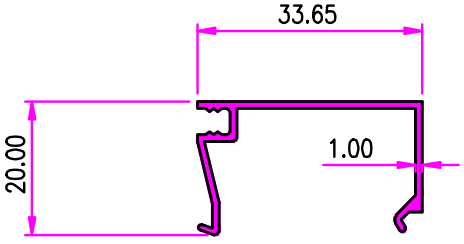
DIE 11515

W : 0.800 KG/M
P : 378.00 MM



DIE 11512

W : 0.460 KG/M
P : 185.00 MM

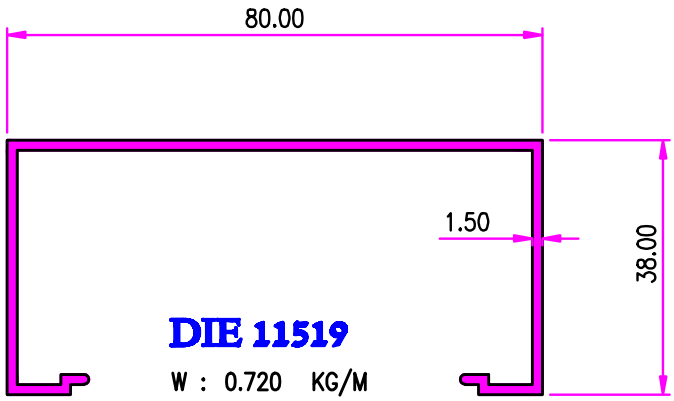


DIE 11516

W : 0.240 KG/M
P : 160.00 MM

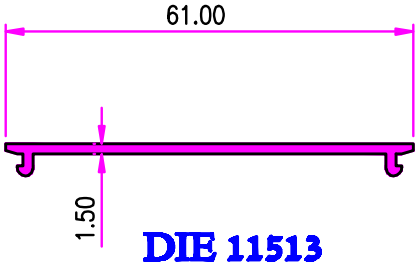
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 80mmX38mm **GROUP : 6I-2**



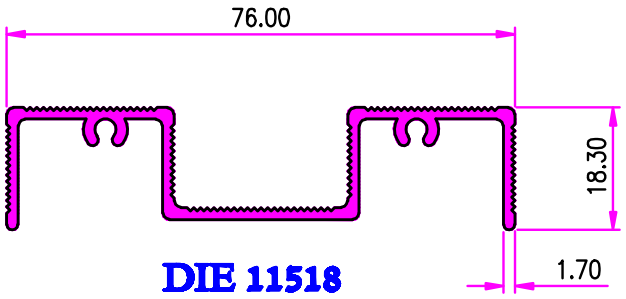
DIE 11519

W : 0.720 KG/M
P : 356.71 MM



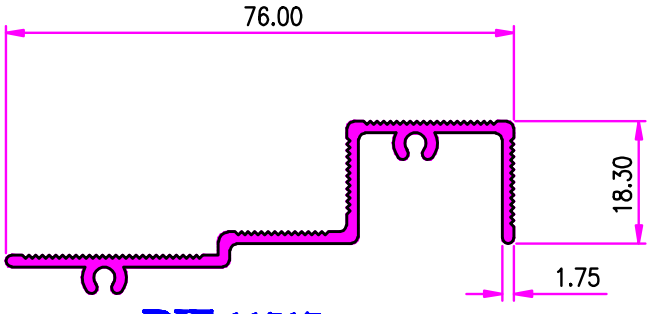
DIE 11513

W : 0.276 KG/M
P : 138.76 MM



DIE 11518

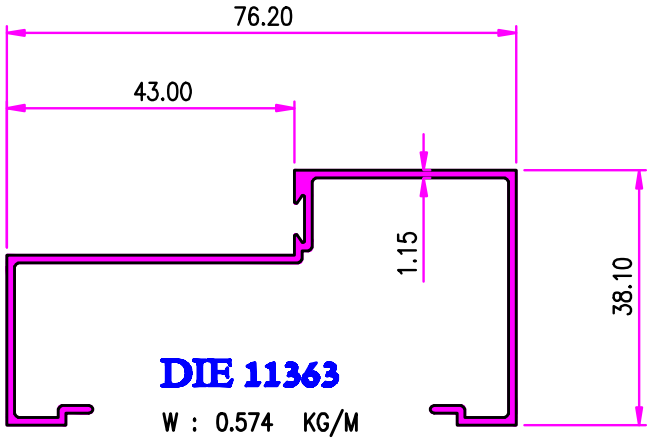
W : 0.648 KG/M
P : 351.47 MM



DIE 11517

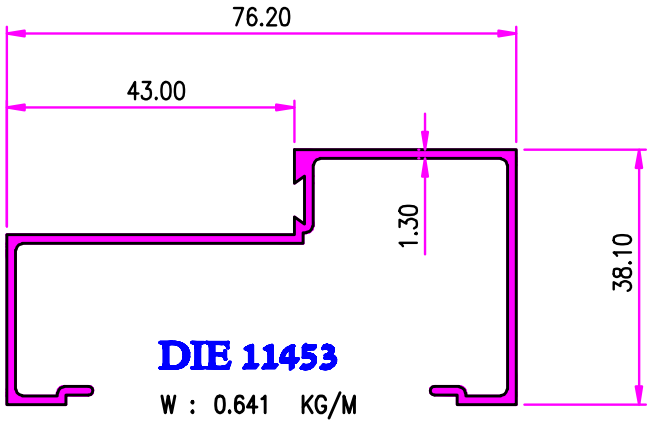
W : 0.552 KG/M
P : 288.91 MM

OTHERS **GROUP : 6J-1**



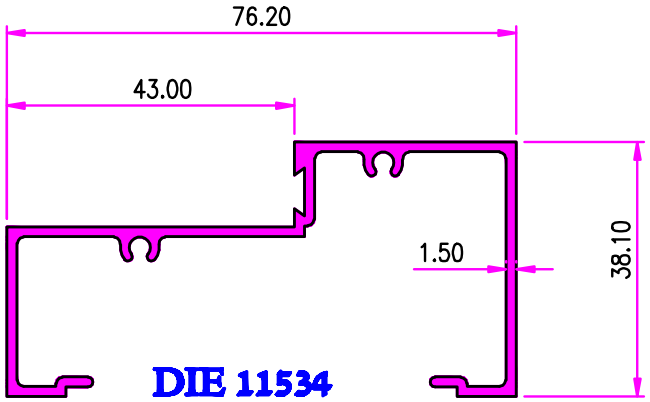
DIE 11363

W : 0.574 KG/M
P : 359.48 MM



DIE 11453

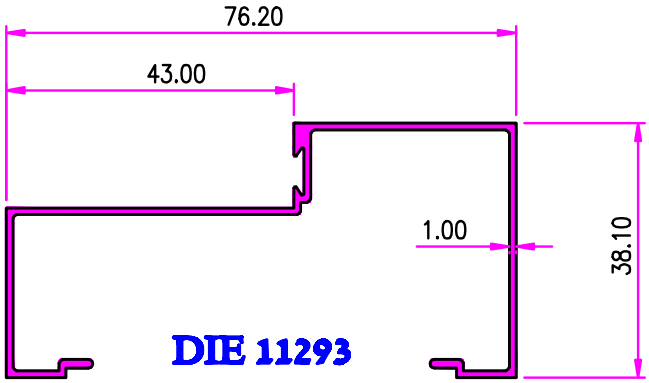
W : 0.641 KG/M
P : 358.93 MM



DIE 11534

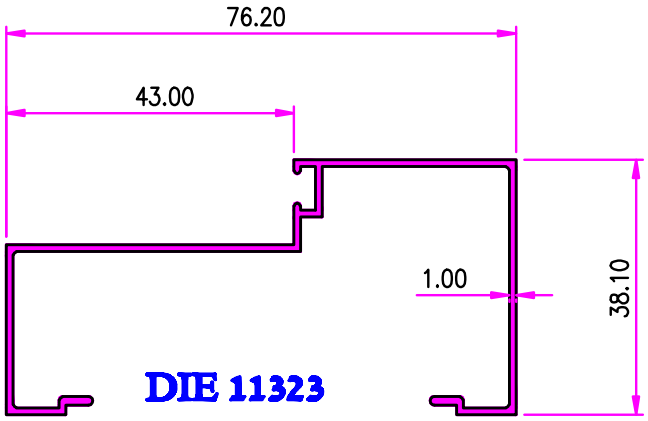
W : 0.830 KG/M
P : 386.00 MM

OTHERS **GROUP : 6J-2**



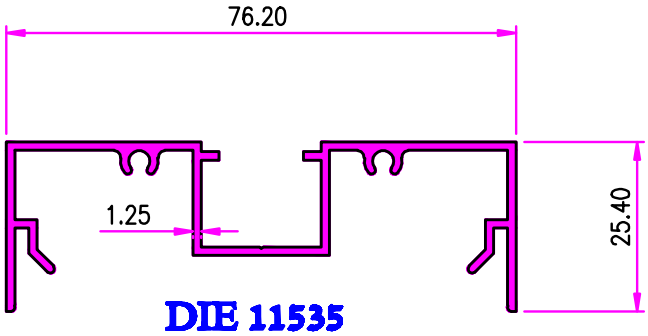
DIE 11293

W : 0.510 KG/M
P : 360.37 MM



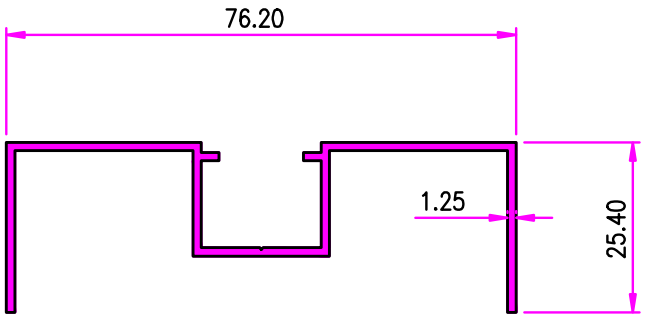
DIE 11323

W : 0.501 KG/M
P : 364.82 MM



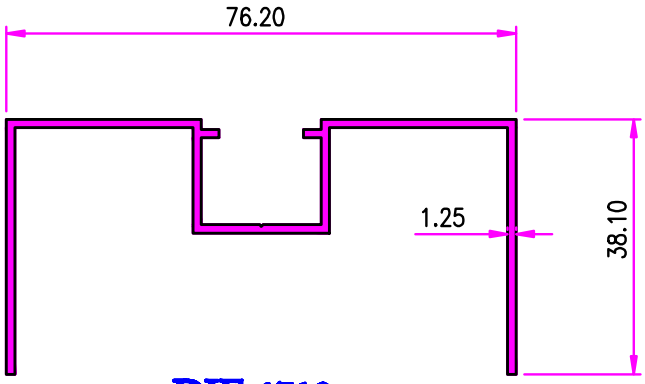
DIE 11535

W : 0.704 KG/M
P : 402.20 MM



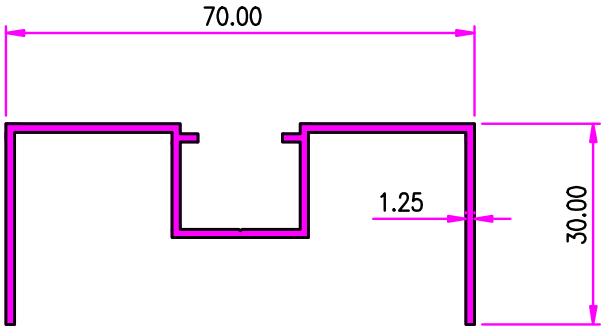
DIE 4631

W : 0.546 KG/M
P : 325.11 MM



DIE 4718

W : 0.632 KG/M
P : 375.91 MM

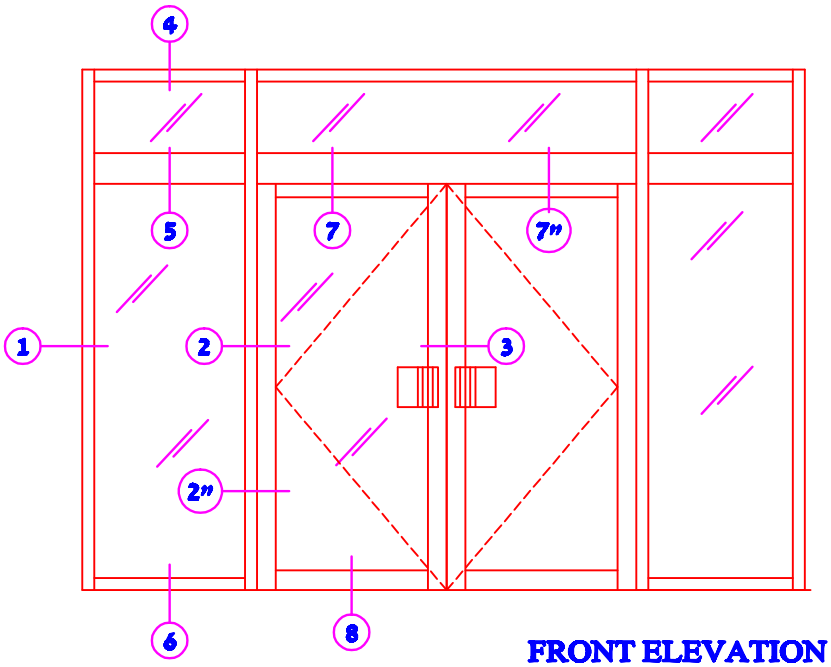


DIE 4719

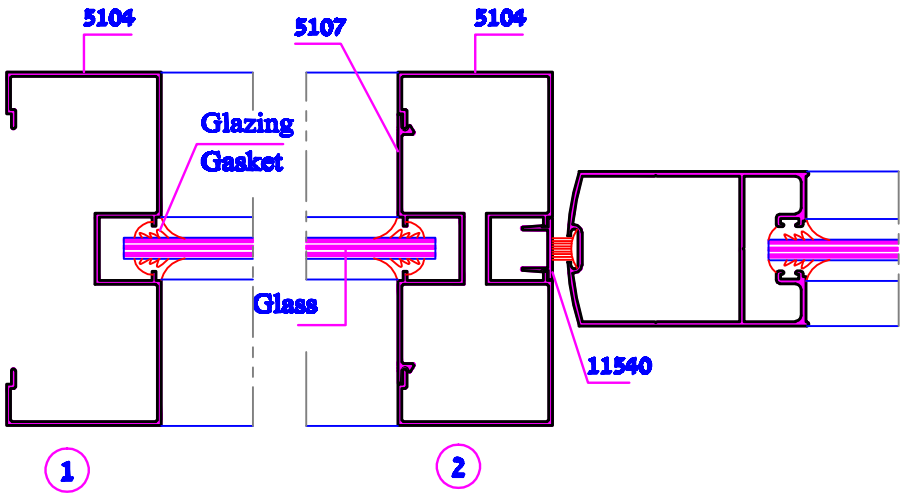
W : 0.556 KG/M
P : 331.11 MM

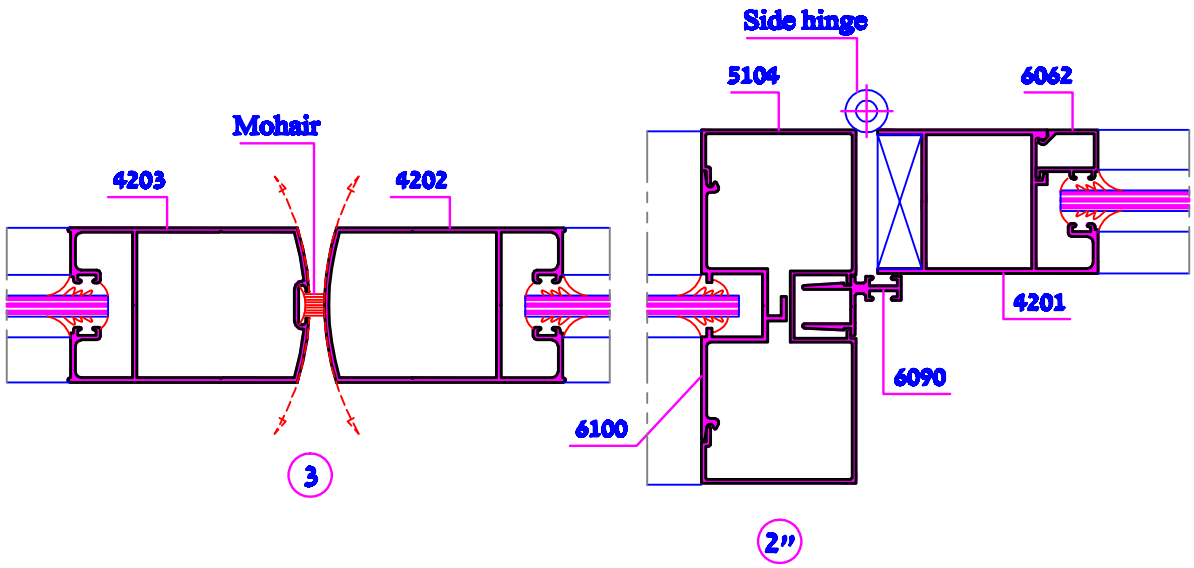
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 4"x1 3/4" ASSEMBLY DETAIL — GROUP : 7A-1



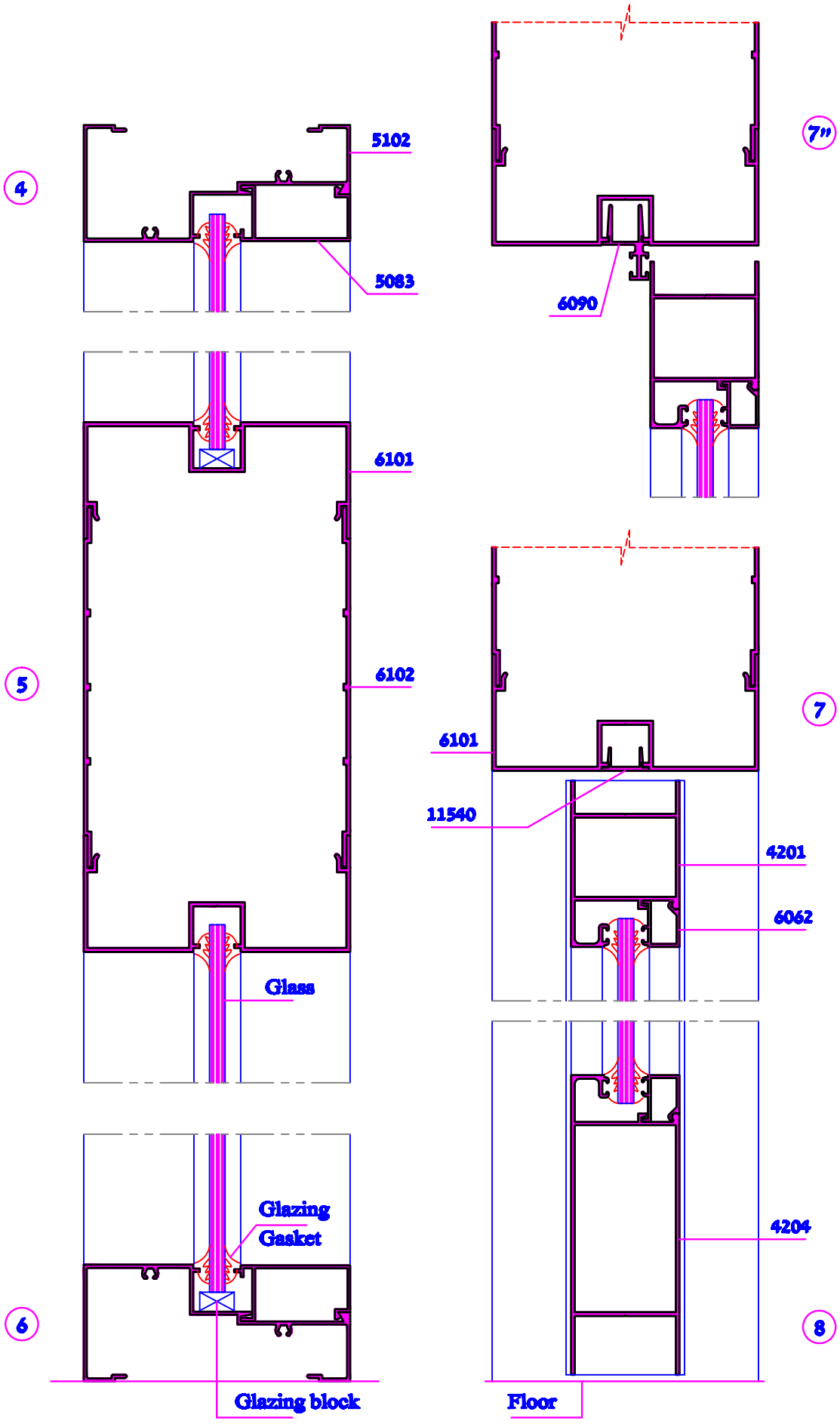
FRONT ELEVATION





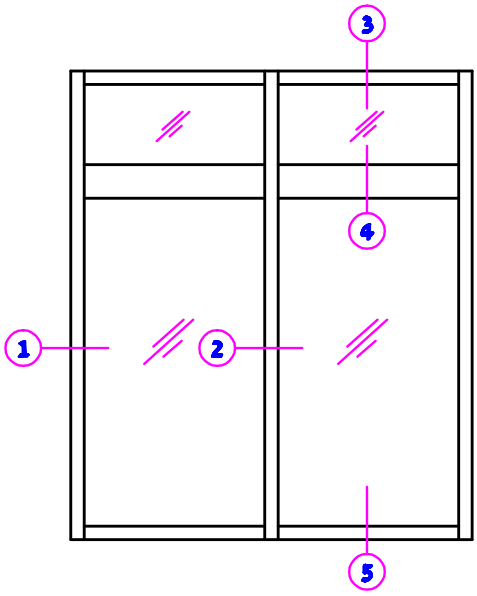
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

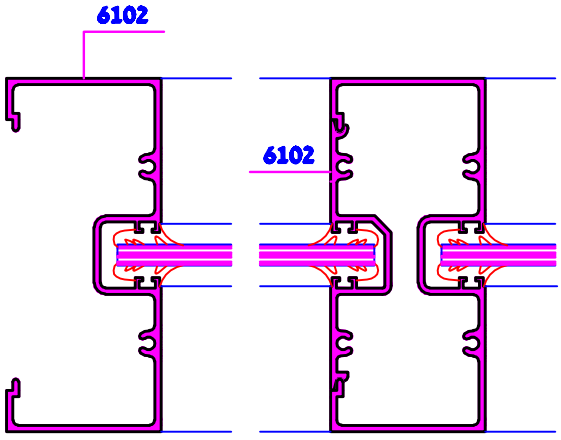
SHOP FRONT 4"x1 3/4" ASSEMBLY DETAIL — GROUP : 7A-2



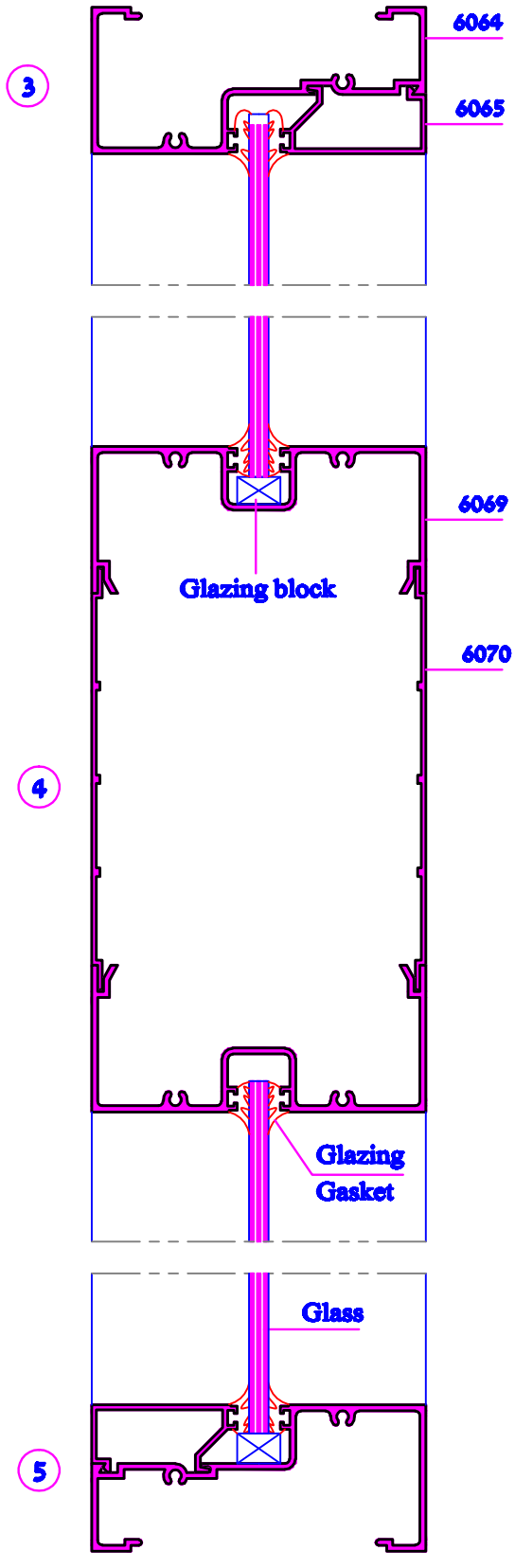
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 4"x1 3/4" ASSEMBLY DETAIL — GROUP : 7A-3



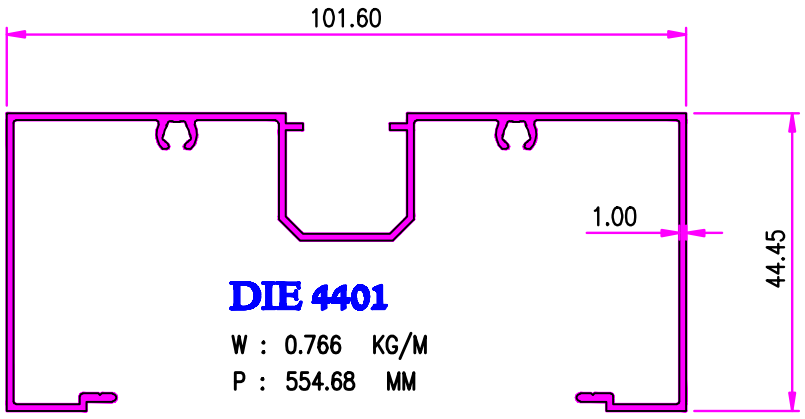


1 2



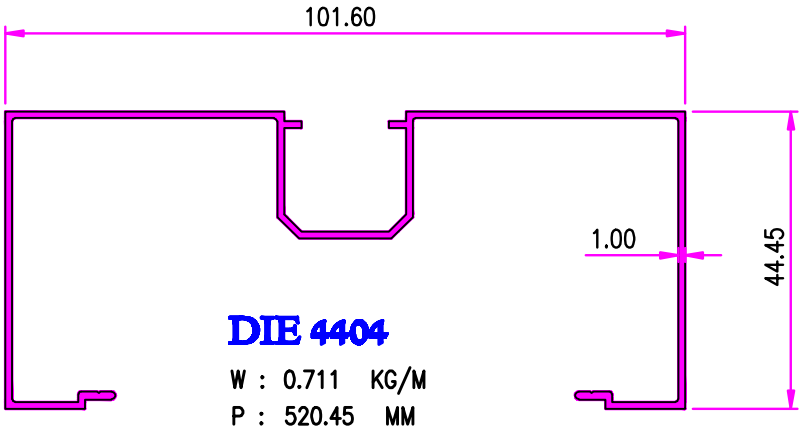
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 4"X13/4"X1.00MM **GROUP : 7B-1**



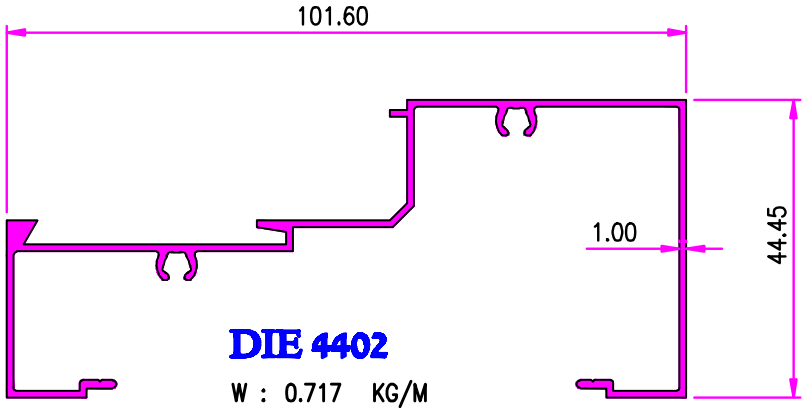
DIE 4401

W : 0.766 KG/M
P : 554.68 MM



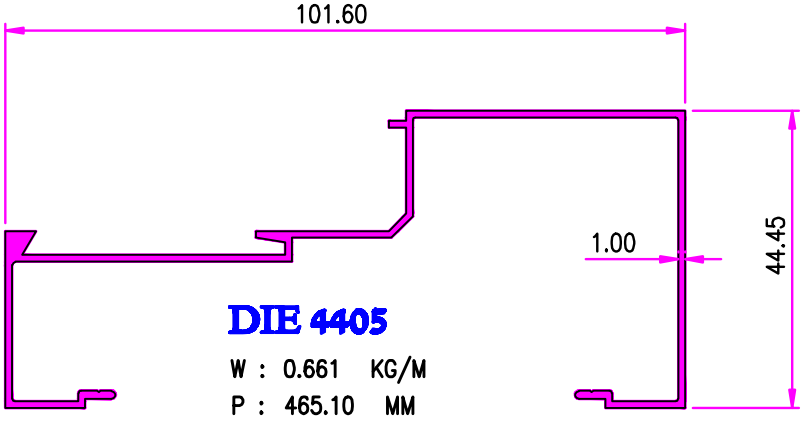
DIE 4404

W : 0.711 KG/M
P : 520.45 MM



DIE 4402

W : 0.717 KG/M
P : 497.44 MM

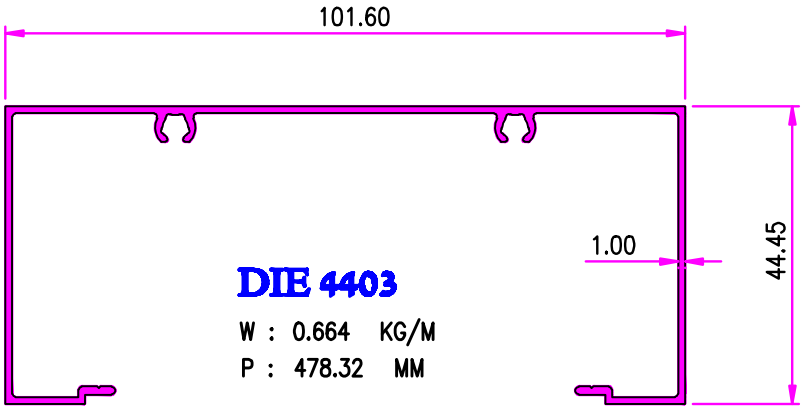


DIE 4405

W : 0.661 KG/M
P : 465.10 MM

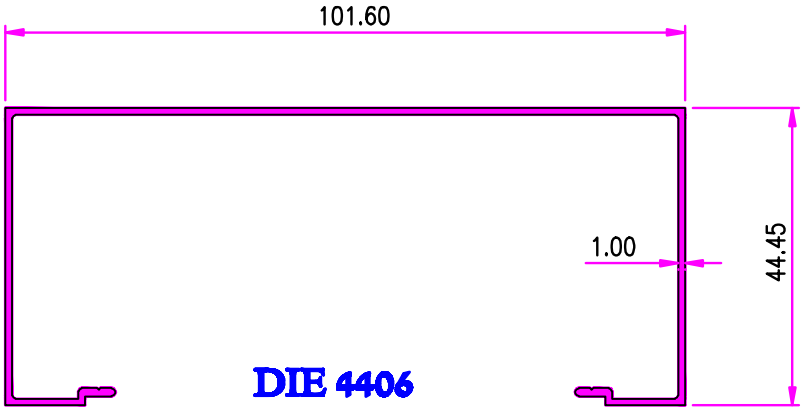
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 4"X13/4"X1.00MM **GROUP : 7B-2**



DIE 4403

W : 0.664 KG/M
P : 478.32 MM

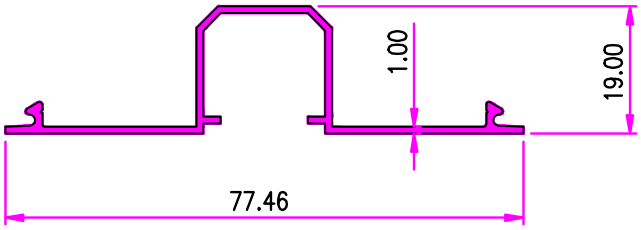


DIE 4406

W : 0.608 KG/M
P : 445.51 MM

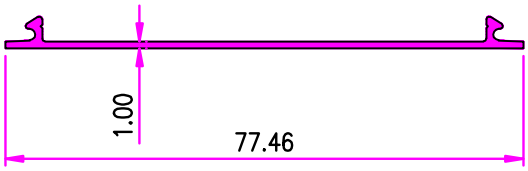
DIE 4407

W : 0.344 KG/M
P : 248.70 MM



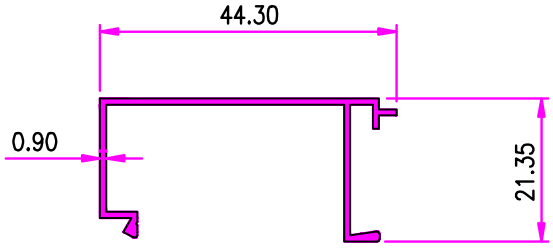
DIE 4408

W : 0.241 KG/M
P : 173.45 MM



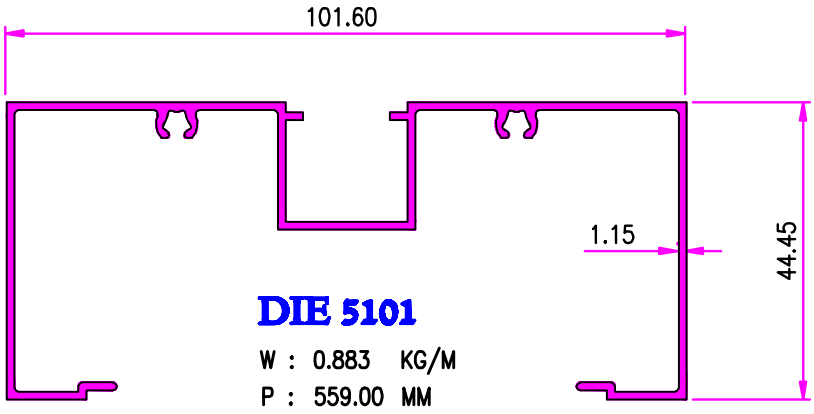
DIE 4409

W : 0.245 KG/M
P : 197.73 MM



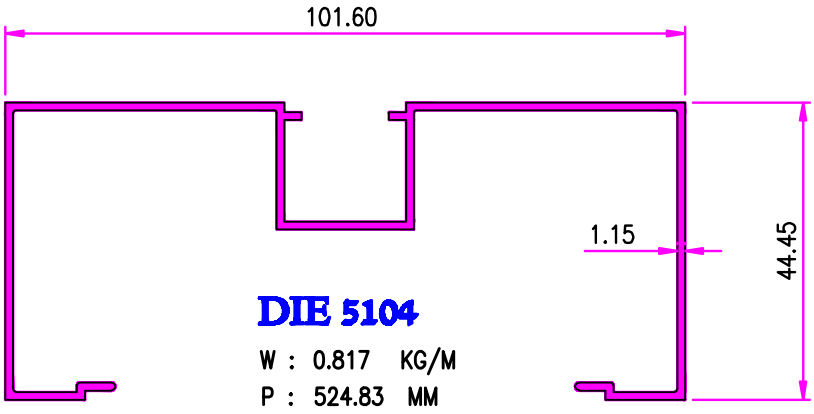
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 4"X13/4"X1.15mm **GROUP : 7C-1**



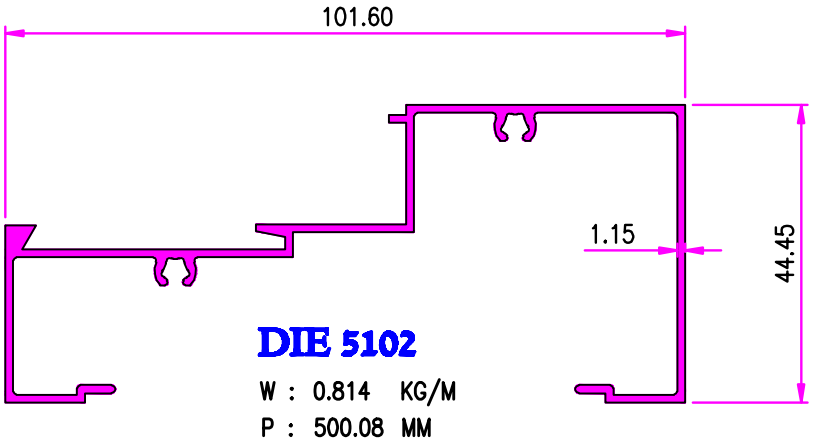
DIE 5101

W : 0.883 KG/M
P : 559.00 MM



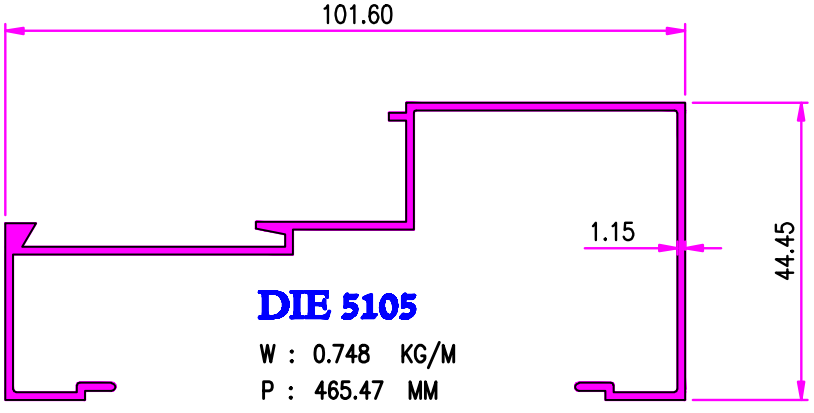
DIE 5104

W : 0.817 KG/M
P : 524.83 MM



DIE 5102

W : 0.814 KG/M
P : 500.08 MM

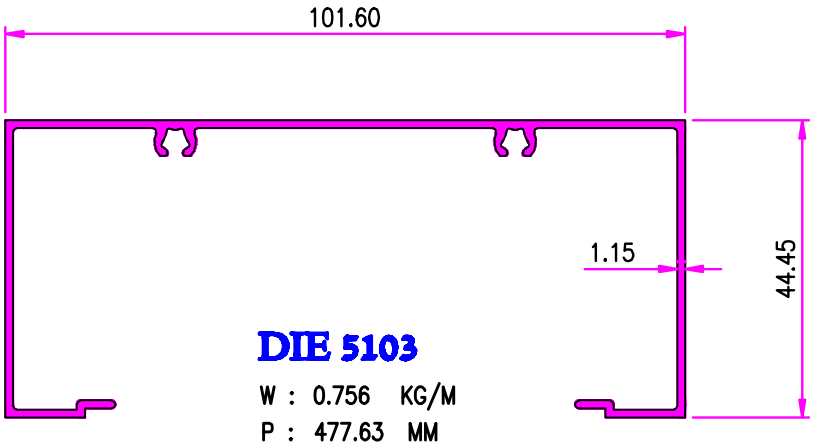


DIE 5105

W : 0.748 KG/M
P : 465.47 MM

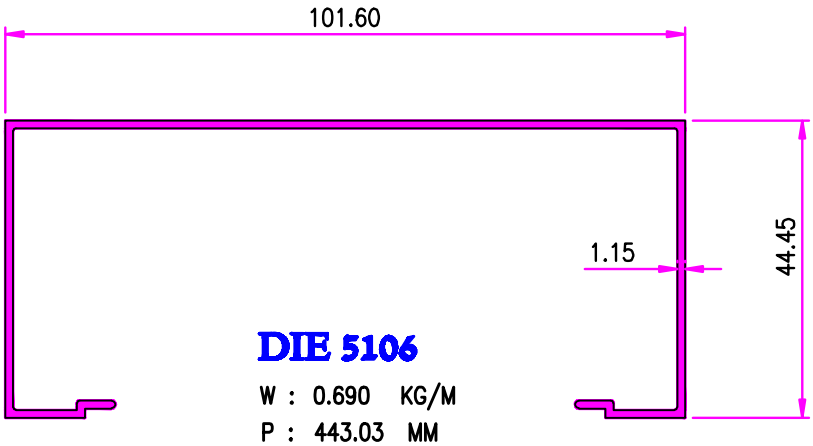
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 4"X13/4"X1.15mm **GROUP : 7C-2**



DIE 5103

W : 0.756 KG/M
P : 477.63 MM

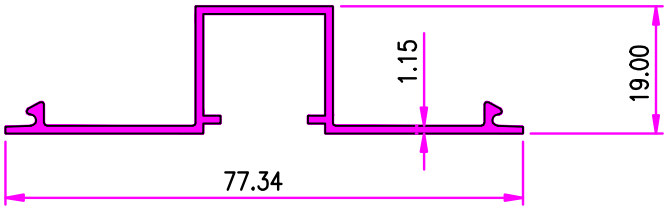


DIE 5106

W : 0.690 KG/M
P : 443.03 MM

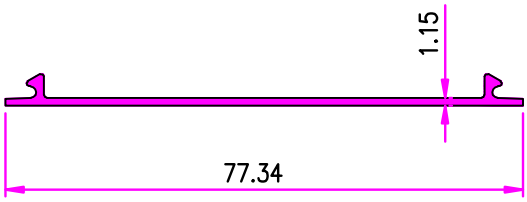
DIE 5107

W : 0.399 KG/M
P : 254.12 MM



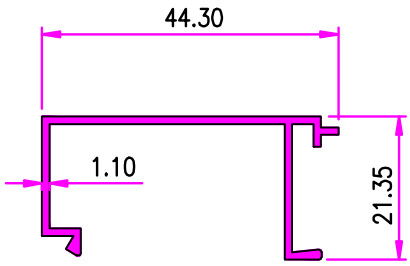
DIE 5108

W : 0.271 KG/M
P : 172.66 MM



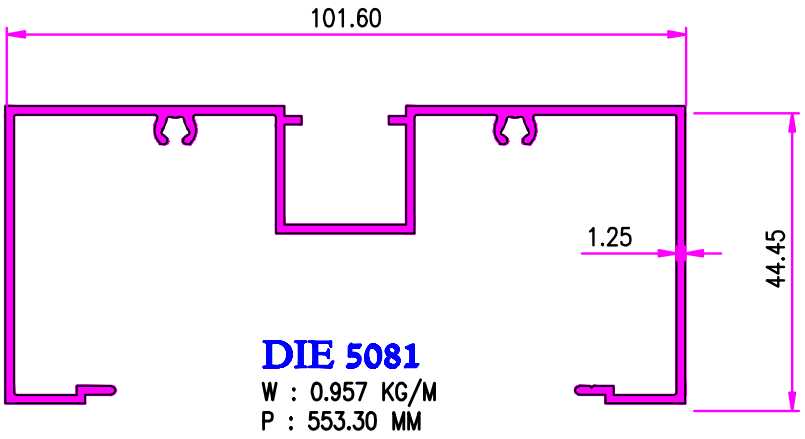
DIE 5083

W : 0.294 KG/M
P : 196.33 MM

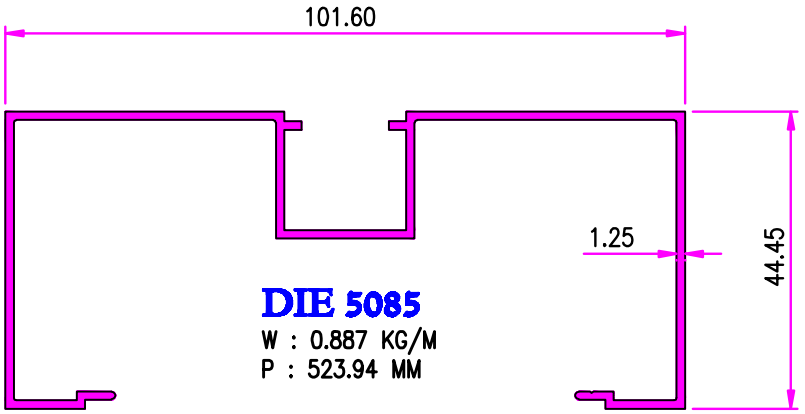


PT.ALEXINDO
(Aluminium Extrusions Indonesia)

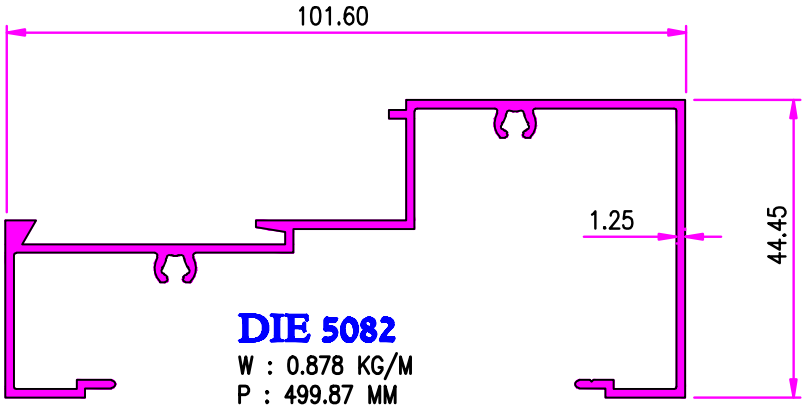
SHOP FRONT 4"X13/4"X1.25MM **GROUP : 7D-1**



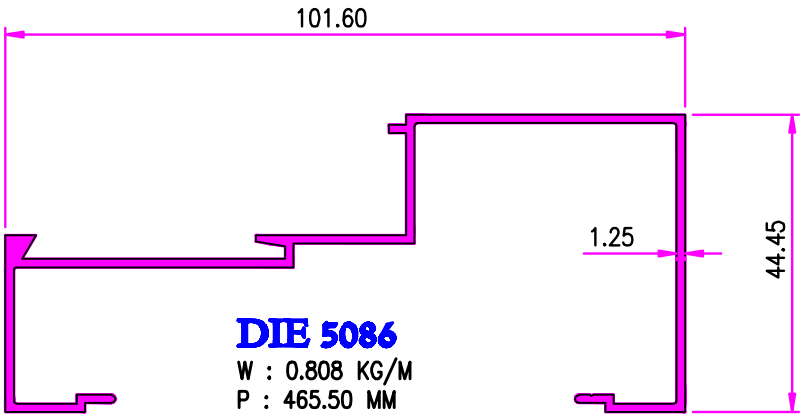
DIE 5081
W : 0.957 KG/M
P : 553.30 MM



DIE 5085
W : 0.887 KG/M
P : 523.94 MM



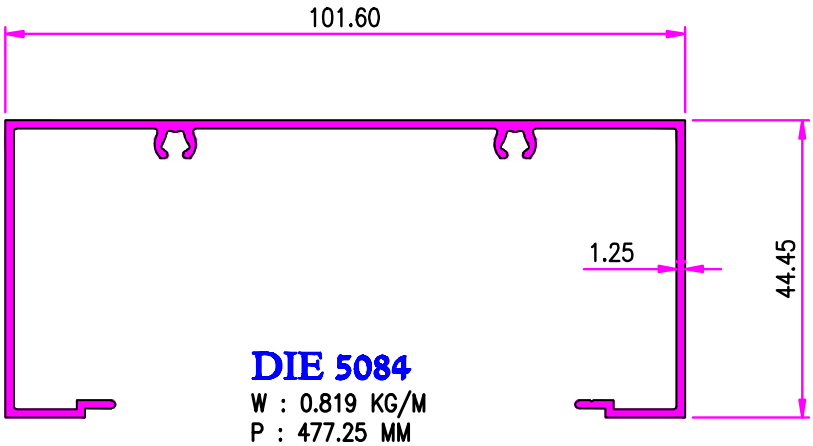
DIE 5082
W : 0.878 KG/M
P : 499.87 MM



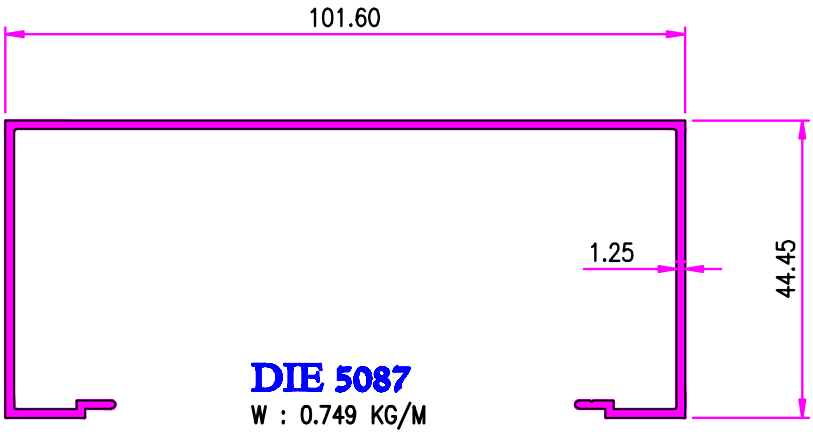
DIE 5086
W : 0.808 KG/M
P : 465.50 MM

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 4"X13/4"X1.25mm **GROUP : 7D-2**

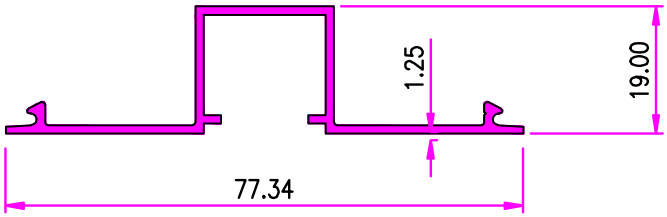


DIE 5084
W : 0.819 KG/M
P : 477.25 MM

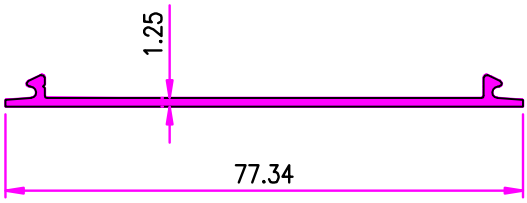


DIE 5087
W : 0.749 KG/M
P : 442.88 MM

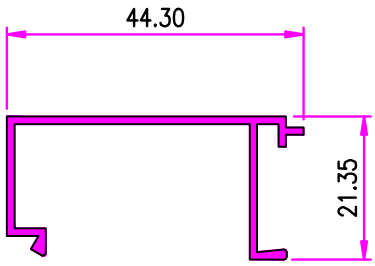
DIE 5088
W : 0.430 KG/M
P :253.66 MM



DIE 5089
W : 0.292 KG/M
P : 172.60 MM

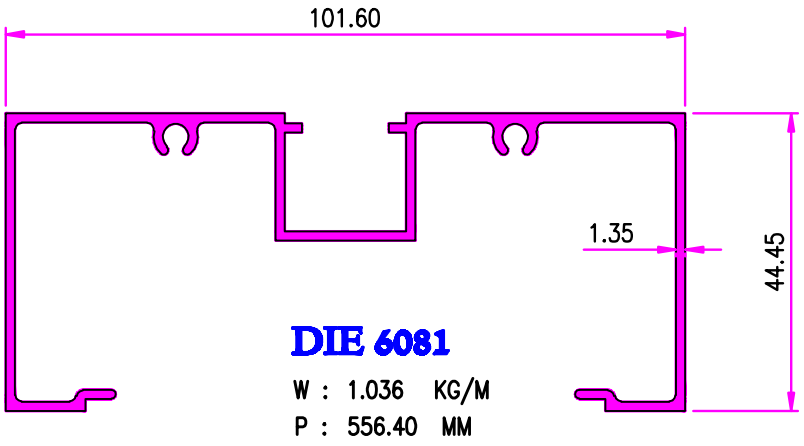


DIE 5083
W : 0.294 KG/M
P : 193.33 MM



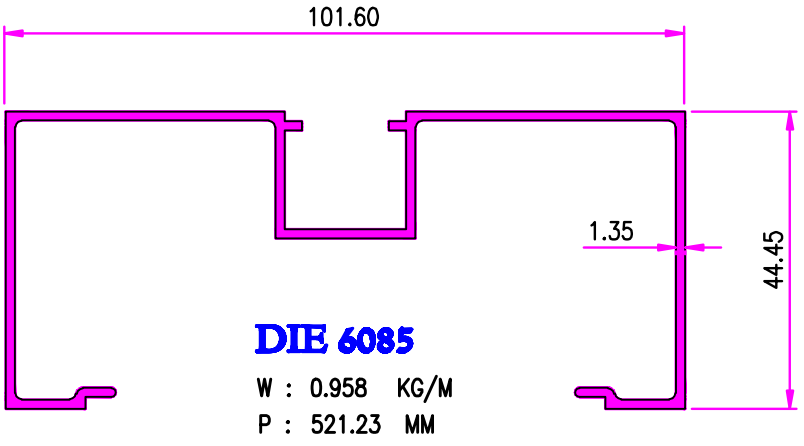
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 4"X13/4"x1.35mm **GROUP : 7E-1**



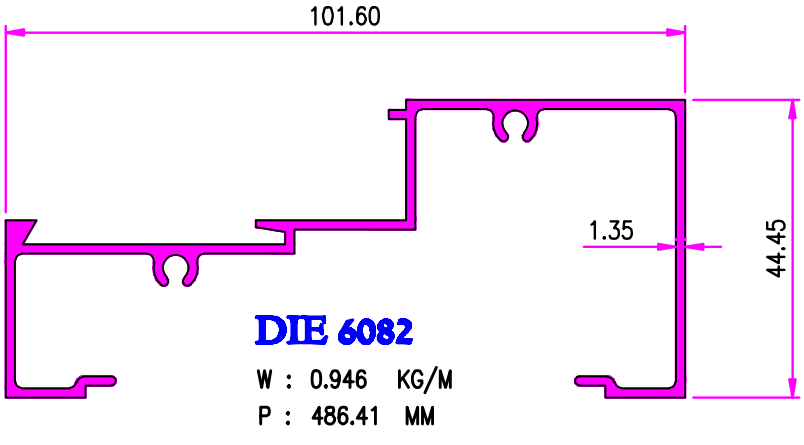
DIE 6081

W : 1.036 KG/M
P : 556.40 MM



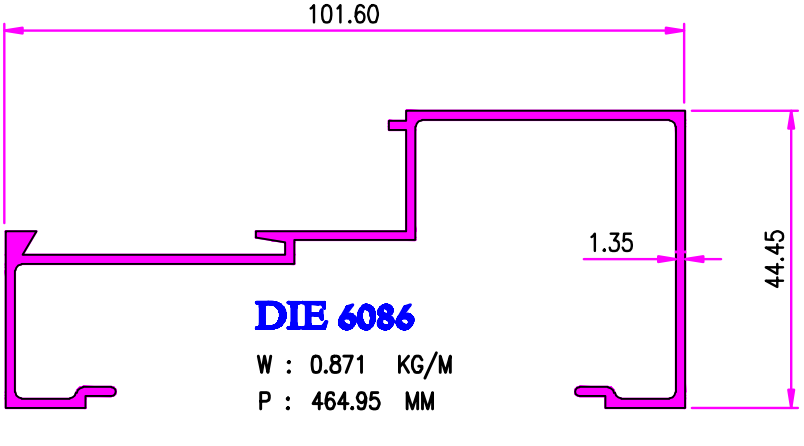
DIE 6085

W : 0.958 KG/M
P : 521.23 MM



DIE 6082

W : 0.946 KG/M
P : 486.41 MM

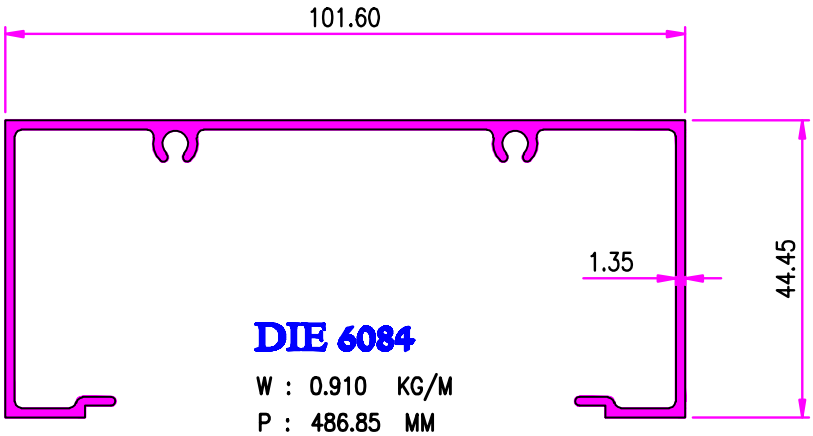


DIE 6086

W : 0.871 KG/M
P : 464.95 MM

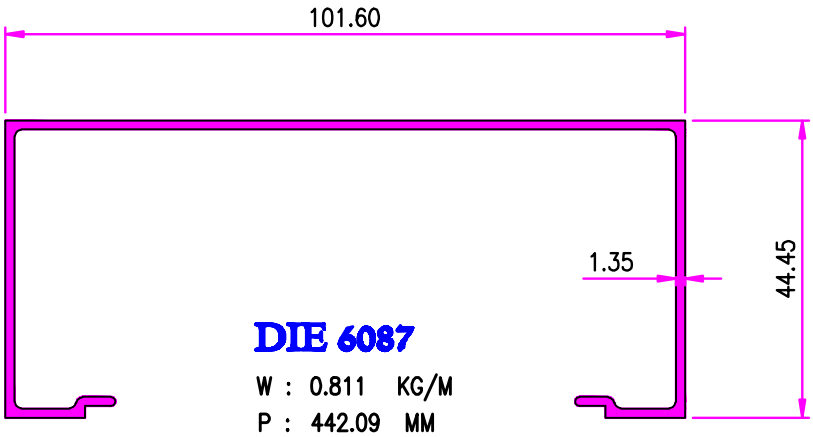
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 4"X13/4"X1.35mm **GROUP : 7E-2**



DIE 6084

W : 0.910 KG/M
P : 486.85 MM

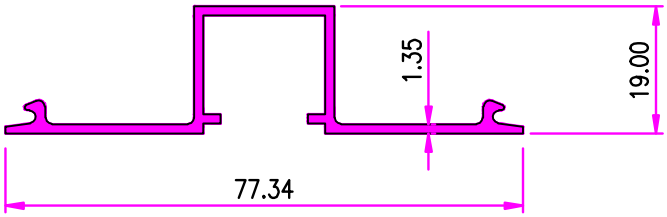


DIE 6087

W : 0.811 KG/M
P : 442.09 MM

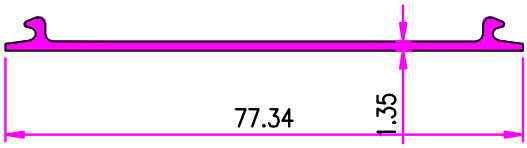
DIE 6088

W : 0.476 KG/M
P : 265.00 MM



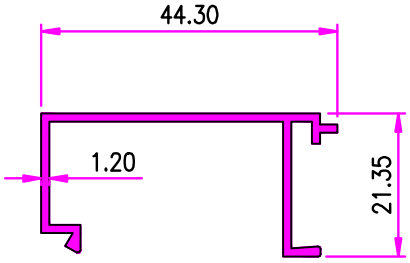
DIE 6089

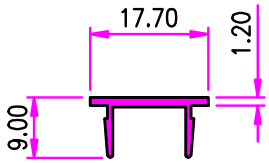
W : 0.325 KG/M
P : 182.00 MM



DIE 6083

W : 0.319 KG/M
P : 195.79 MM



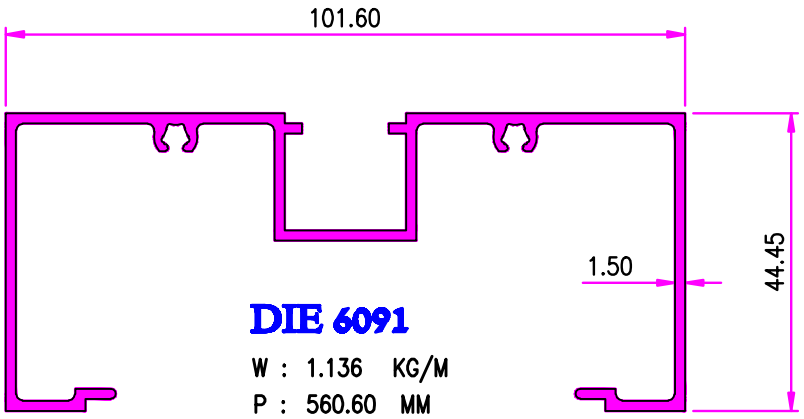


DIE 11540

W : 0.124 KG/M
P : 69.69 MM

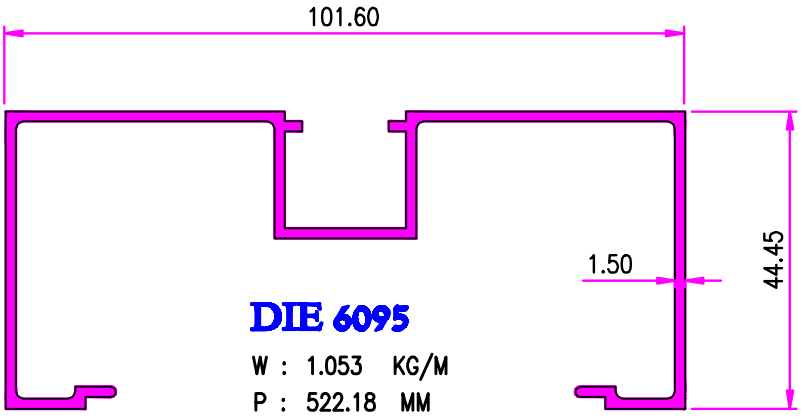
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 4"X13/4"x1.50mm **GROUP : 7F-1**



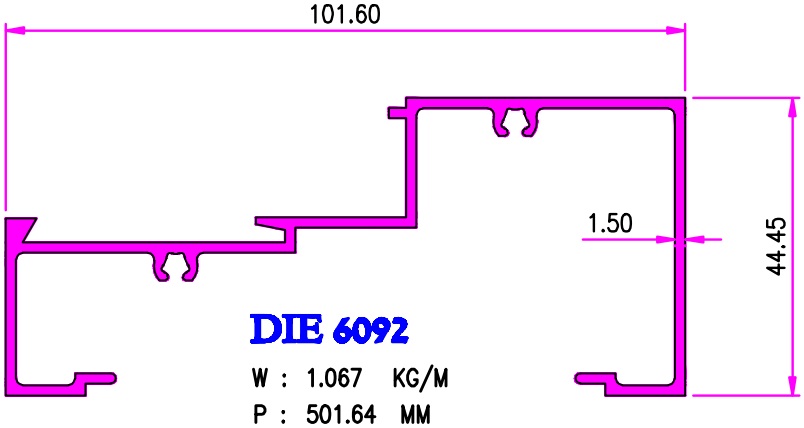
DIE 6091

W : 1.136 KG/M
P : 560.60 MM



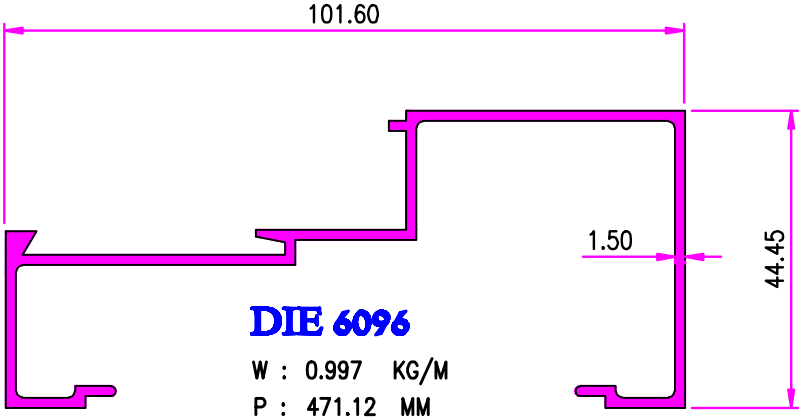
DIE 6095

W : 1.053 KG/M
P : 522.18 MM



DIE 6092

W : 1.067 KG/M
P : 501.64 MM

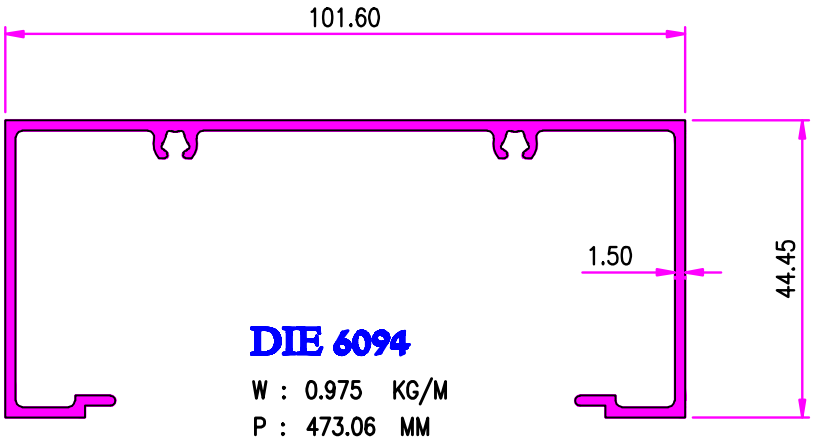


DIE 6096

W : 0.997 KG/M
P : 471.12 MM

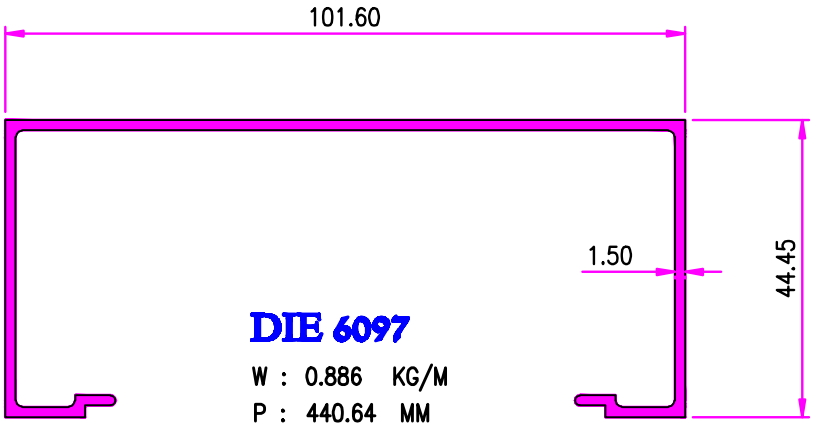
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOP FRONT 4"X13/4"x1.50mm **GROUP : 7F-2**



DIE 6094

W : 0.975 KG/M
P : 473.06 MM

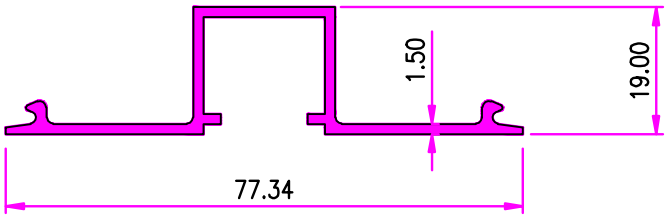


DIE 6097

W : 0.886 KG/M
P : 440.64 MM

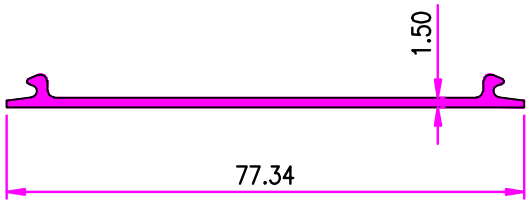
DIE 6098

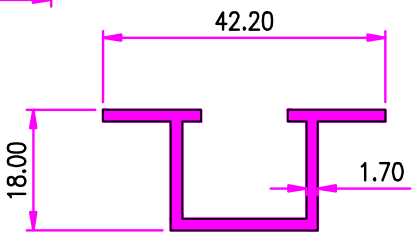
W : 0.544 KG/M
P : 265.51 MM



DIE 6099

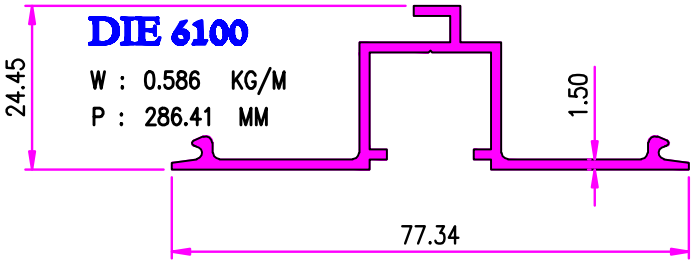
W : 0.376 KG/M
P : 182.47 MM





DIE 6100

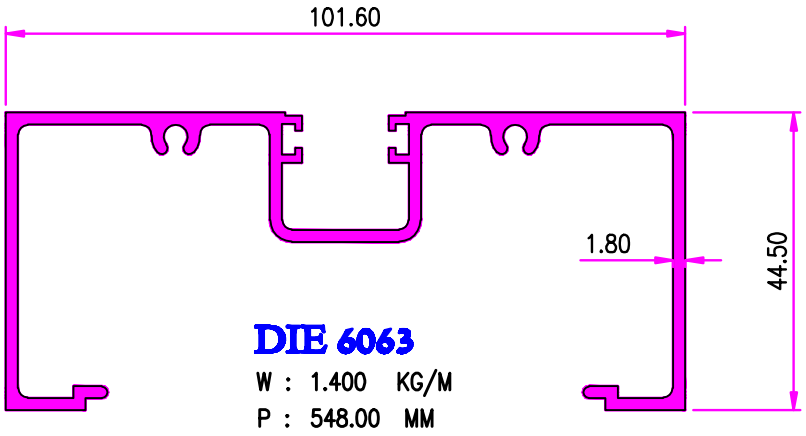
W : 0.586 KG/M
P : 286.41 MM



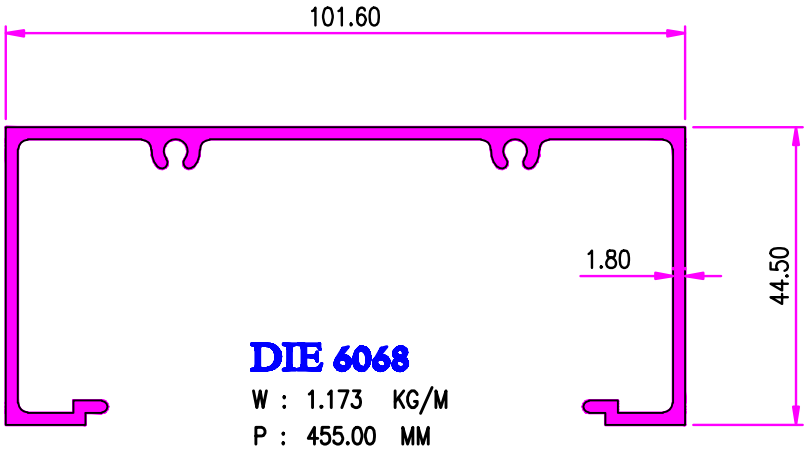
DIE 6108

W : 0.369 KG/M
P : 163.40 MM

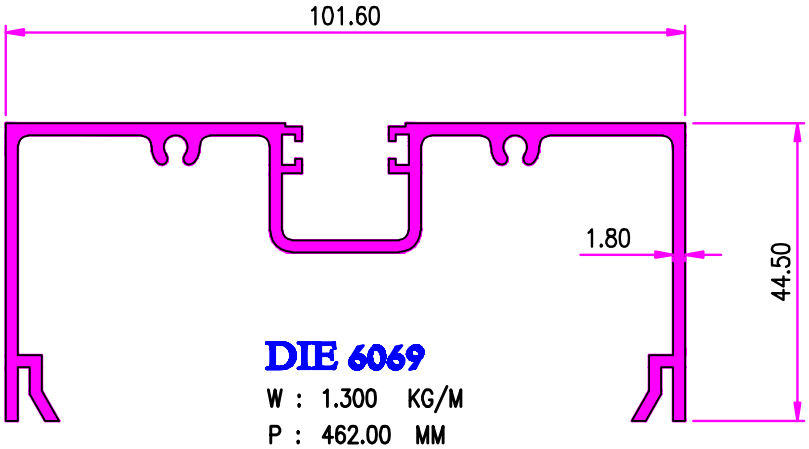
SHOP FRONT 4"X13/4"X1.80 mm **GROUP : 7G-1**



DIE 6063
W : 1.400 KG/M
P : 548.00 MM

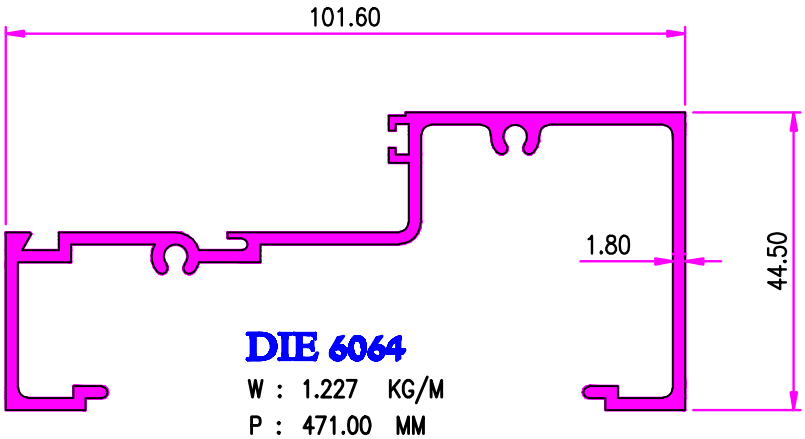


DIE 6068
W : 1.173 KG/M
P : 455.00 MM

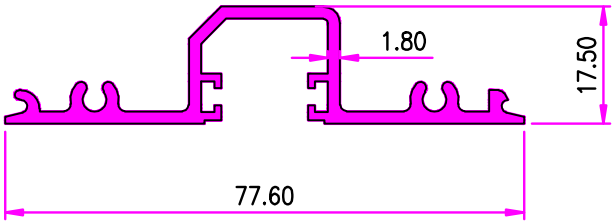


DIE 6069
W : 1.300 KG/M
P : 462.00 MM

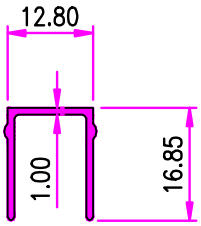
SHOP FRONT 4"X13/4"X1.80 mm **GROUP : 7G-2**



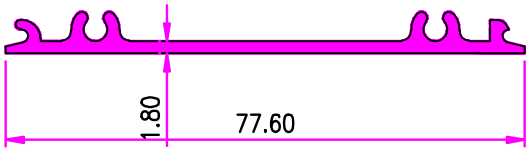
DIE 6064
W : 1.227 KG/M
P : 471.00 MM



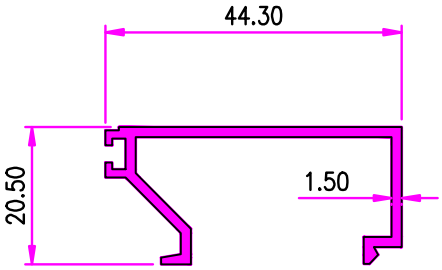
DIE 6066
W : 0.707 KG/M
P : 272.00 MM



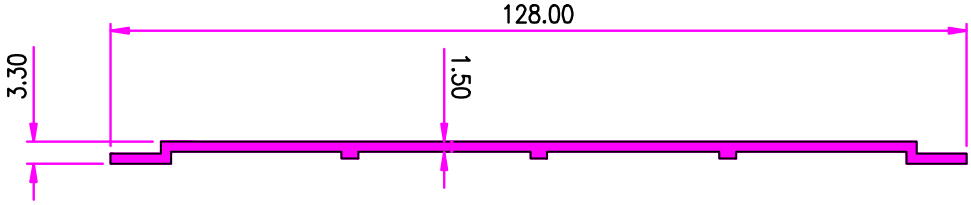
DIE 6071R
W : 0.125 KG/M
P : 90.25 MM



DIE 6067
W : 0.508 KG/M
P : 207.00 MM

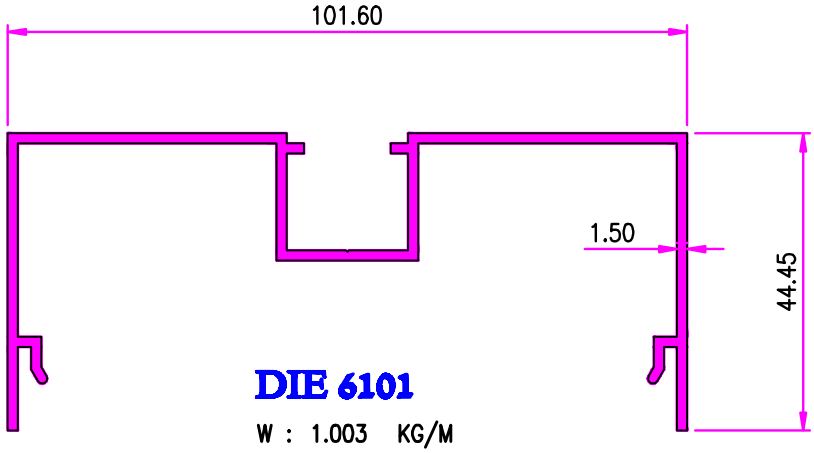


DIE 6065
W : 0.401 KG/M
P : 193.00 MM



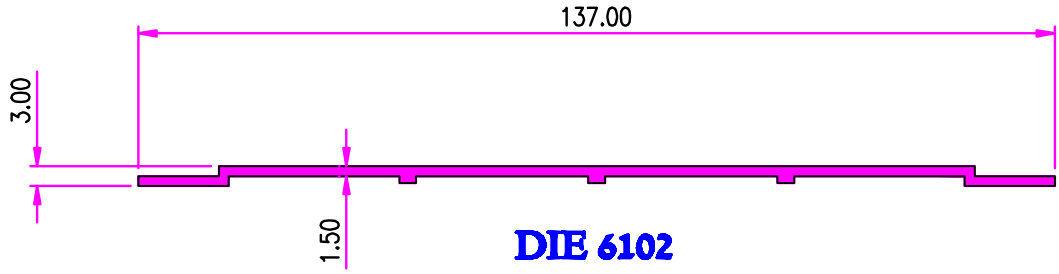
DIE 6070
W : 0.555 KG/M
P : 272.20 MM

OTHERS **GROUP : 7H-1**



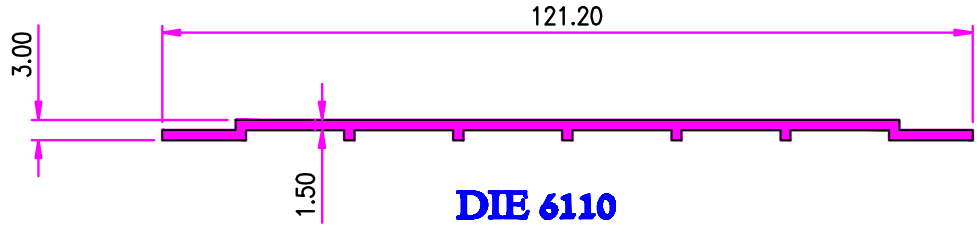
DIE 6101

W : 1.003 KG/M
P : 496.40 MM



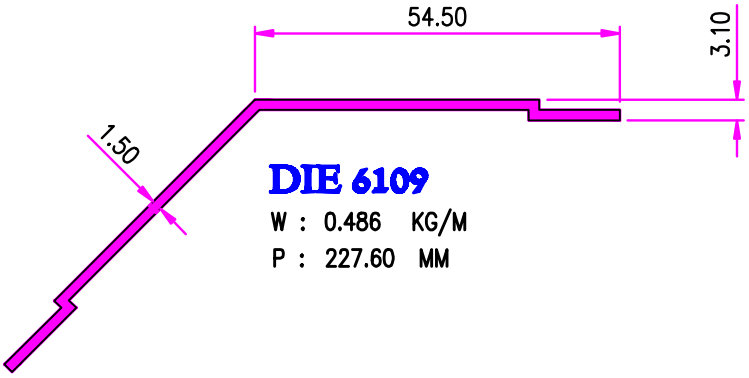
DIE 6102

W : 0.615 KG/M
P : 290.20 MM



DIE 6110

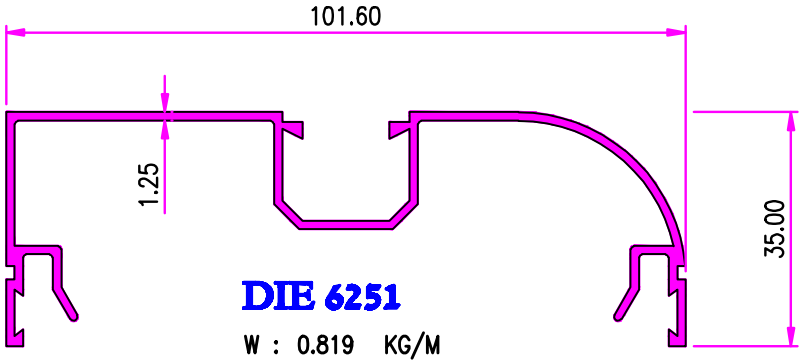
W : 0.535 KG/M
P : 263.40 MM



DIE 6109

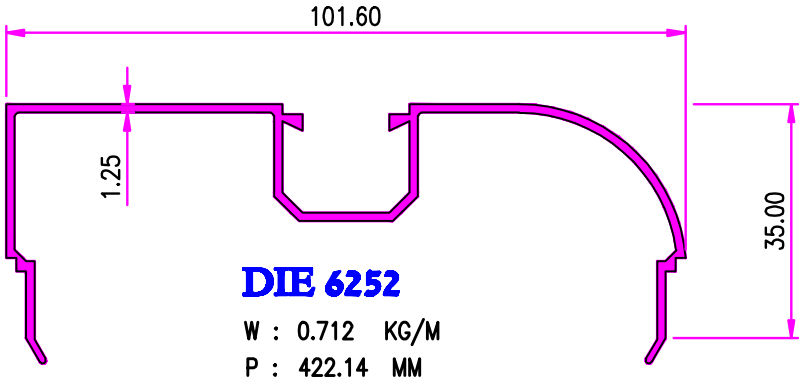
W : 0.486 KG/M
P : 227.60 MM

OTHERS **GROUP : 7H-2**



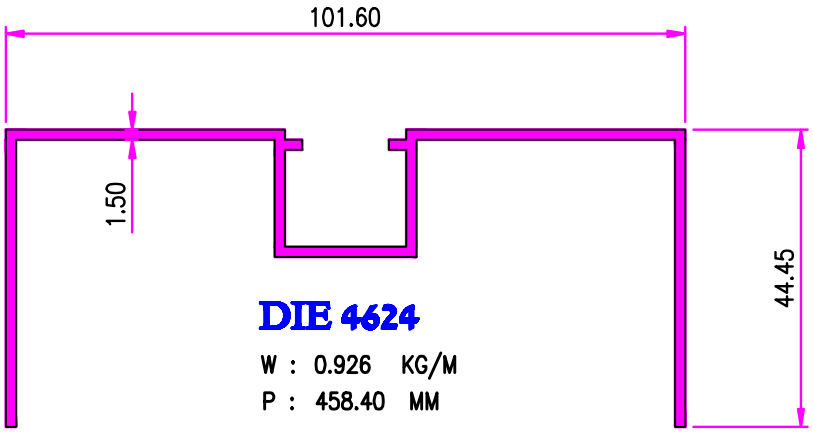
DIE 6251

W : 0.819 KG/M
P : 479.60 MM



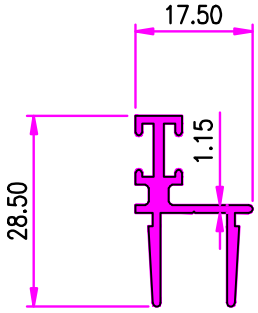
DIE 6252

W : 0.712 KG/M
P : 422.14 MM



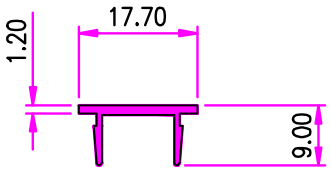
DIE 4624

W : 0.926 KG/M
P : 458.40 MM



DIE 6090R

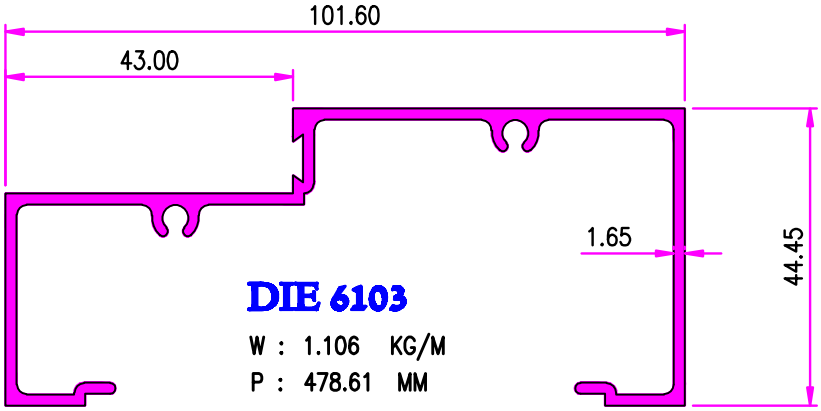
W : 0.279 KG/M
P : 148.50 MM



DIE 11540

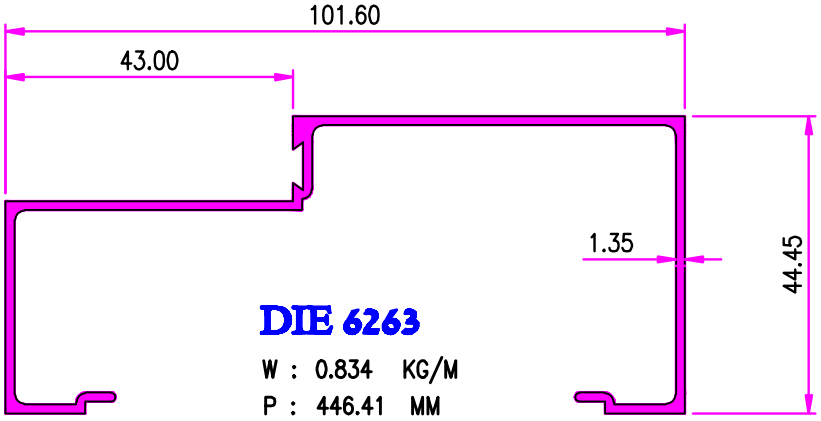
W : 0.124 KG/M
P : 69.69 MM

OTHERS **GROUP : 7H-3**



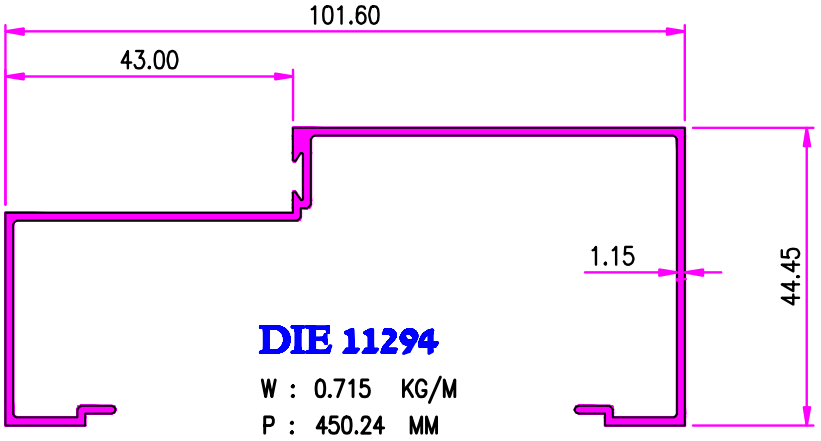
DIE 6103

W : 1.106 KG/M
P : 478.61 MM



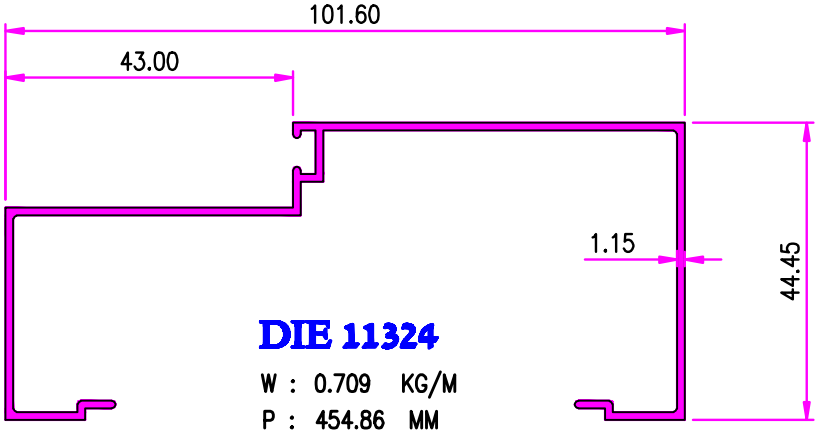
DIE 6263

W : 0.834 KG/M
P : 446.41 MM



DIE 11294

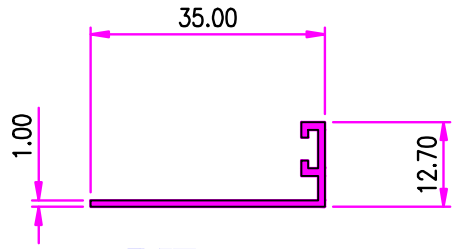
W : 0.715 KG/M
P : 450.24 MM



DIE 11324

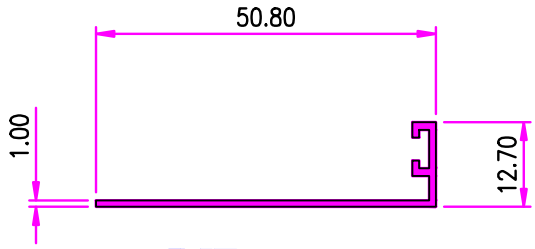
W : 0.709 KG/M
P : 454.86 MM

OTHERS **GROUP : 7H-4**



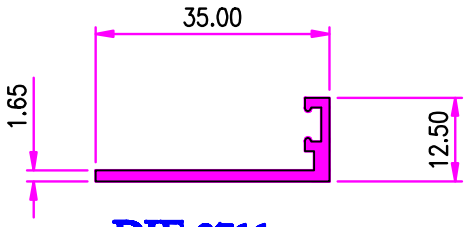
DIE 5959

W : 0.146 KG/M
P : 110.21 MM



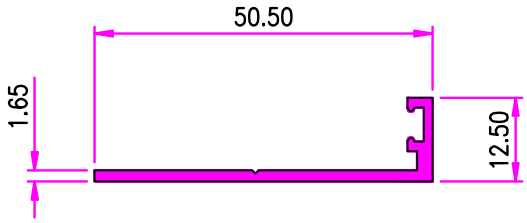
DIE 5960

W : 0.189 KG/M
P : 141.81 MM



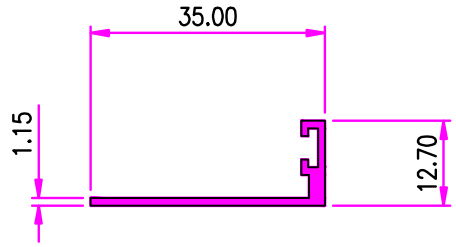
DIE 8711

W : 0.233 KG/M
P : 102.40 MM



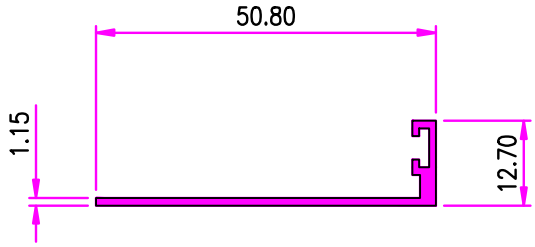
DIE 7017

W : 0.301 KG/M
P : 113.40 MM



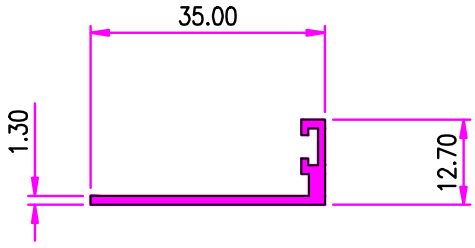
DIE 7586

W : 0.175 KG/M
P : 107.30 MM



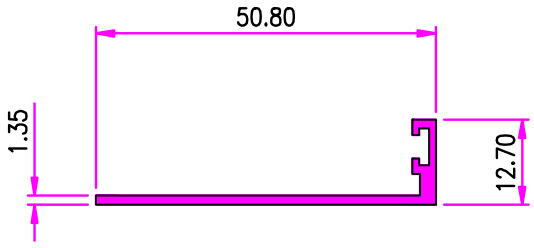
DIE 7587

W : 0.224 KG/M
P : 138.90 MM



DIE 8017

W : 0.214 KG/M
P : 106.80 MM

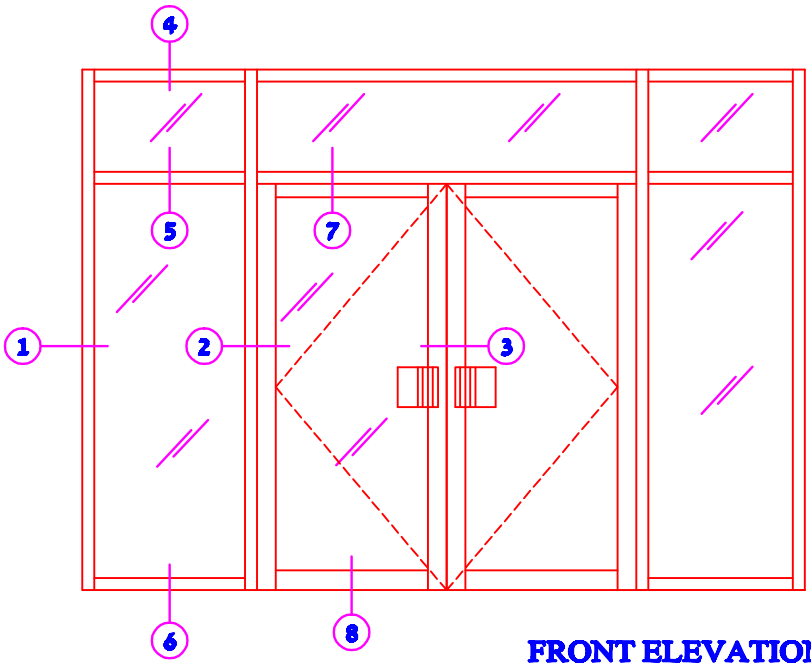


DIE 8018

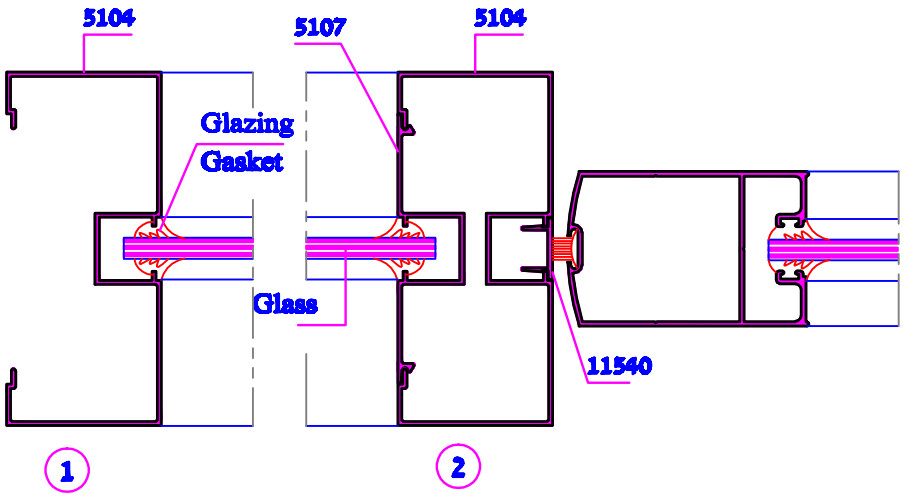
W : 0.265 KG/M
P : 138.40 MM

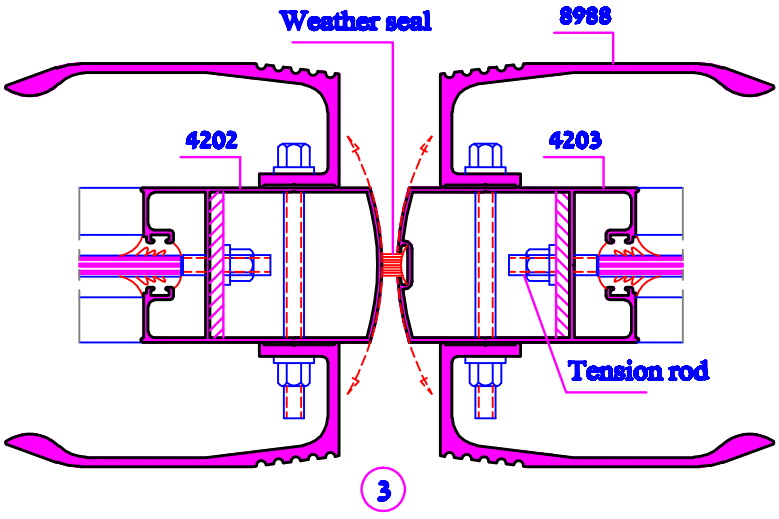
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SWING DOOR & SHOP FRONT 4" ASSEMBLY DETAIL GROUP : 8A-1



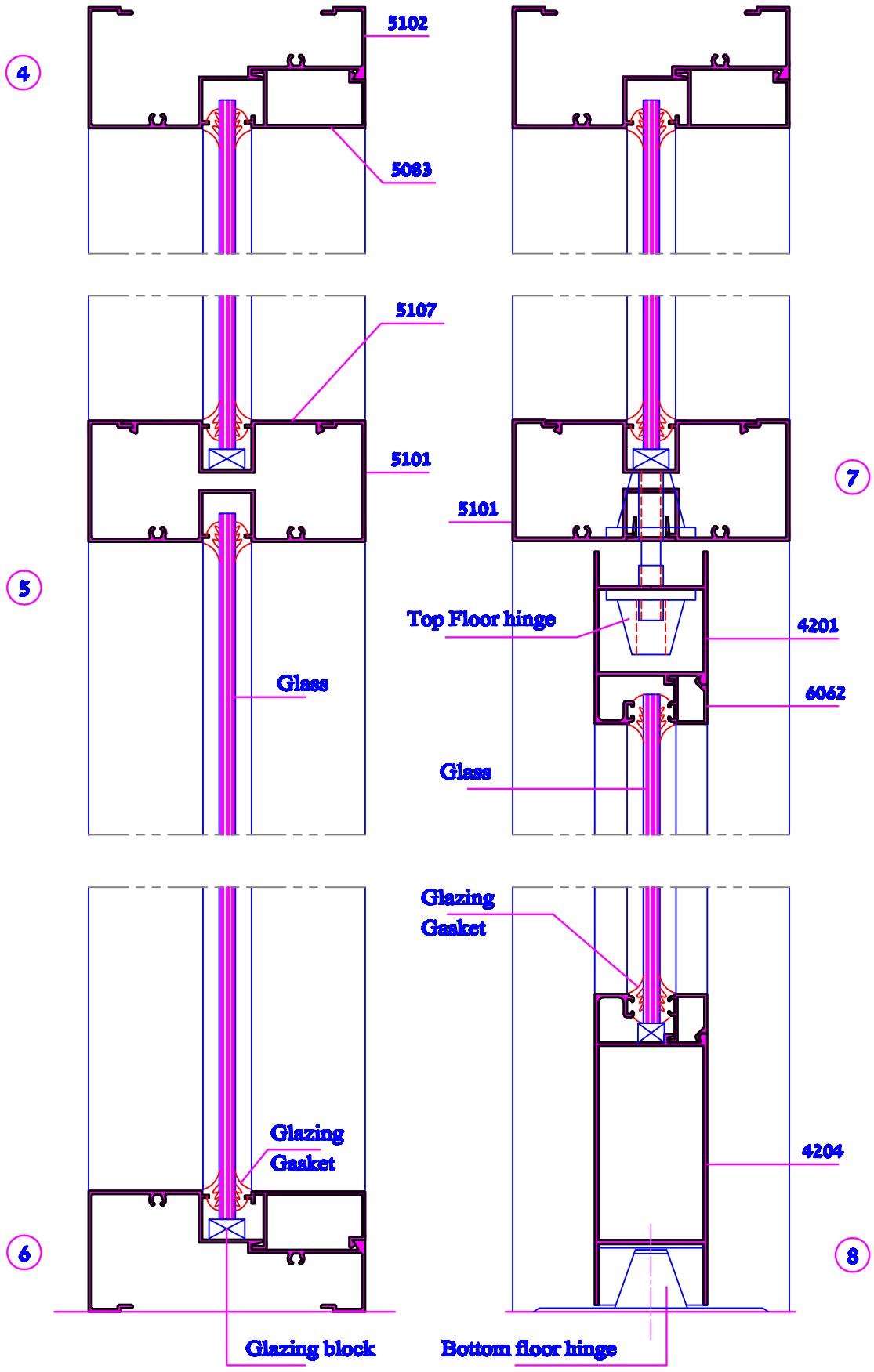
FRONT ELEVATION





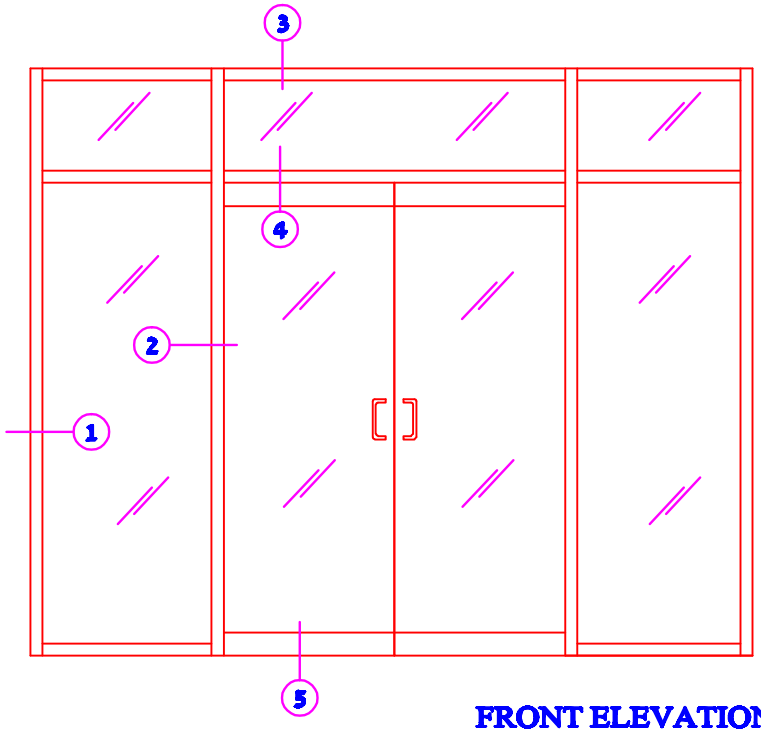
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SWING DOOR & SHOP FRONT 4" ASSEMBLY DETAIL GROUP : 8A-2

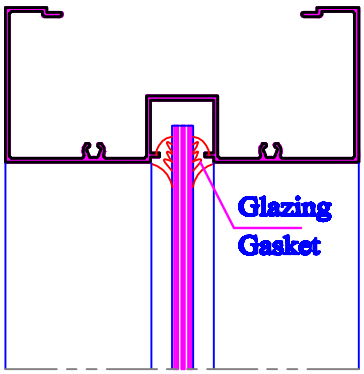


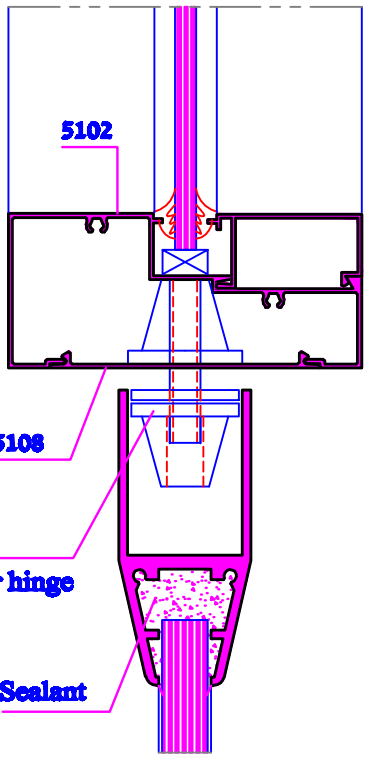
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

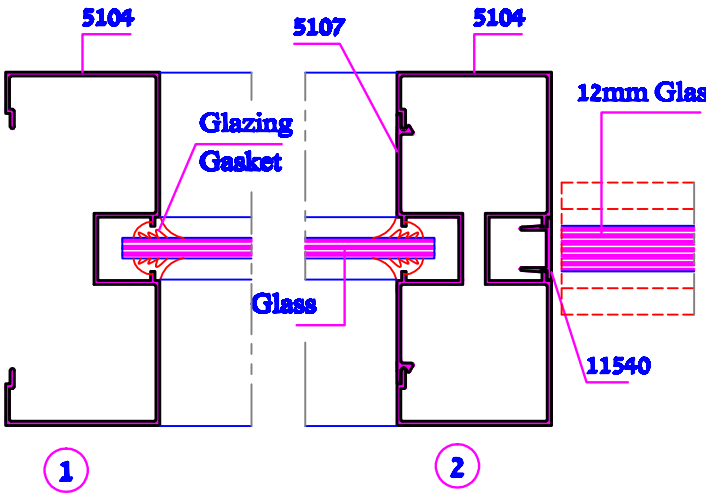
FRAME LESS DOOR & SHOP FRONT 4" ASSEMBLY DETAIL — GROUP : 8A-3

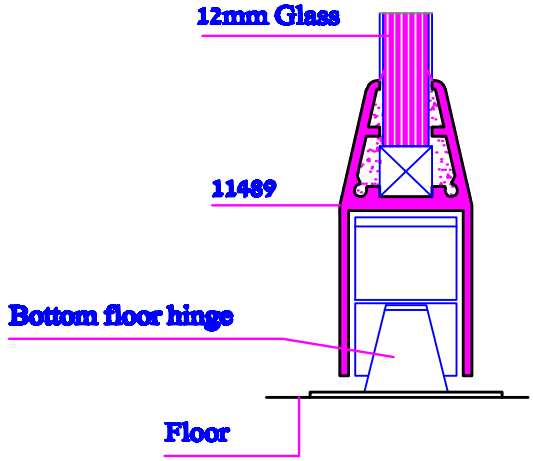


FRONT ELEVATION



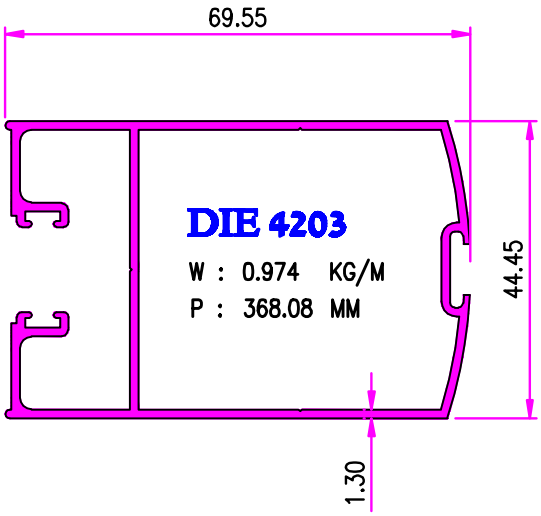


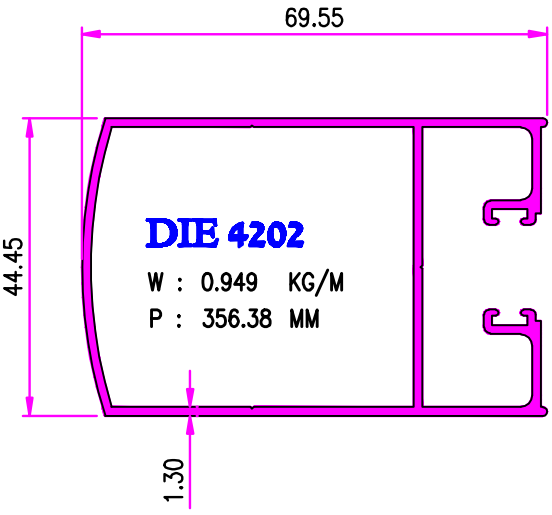


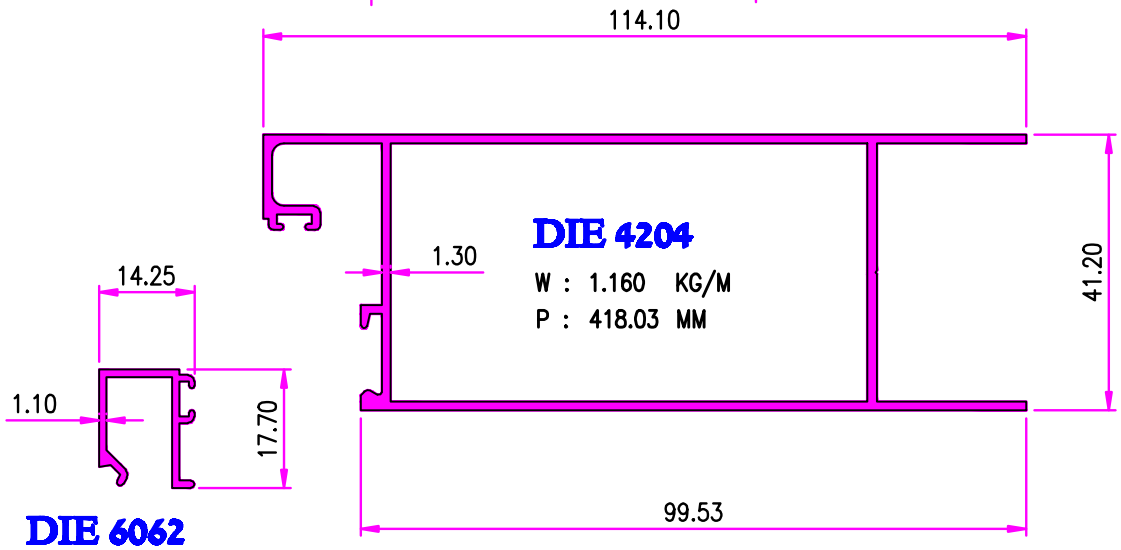


PT.ALEXINDO
(Aluminium Extrusions Indonesia)

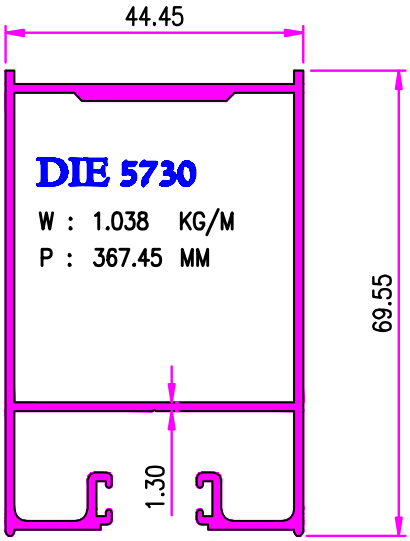
SWING DOOR X 1.30 MM THICK **GROUP : 8B-1**

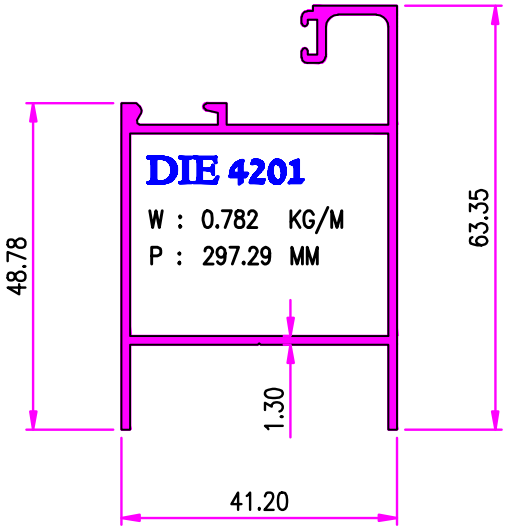






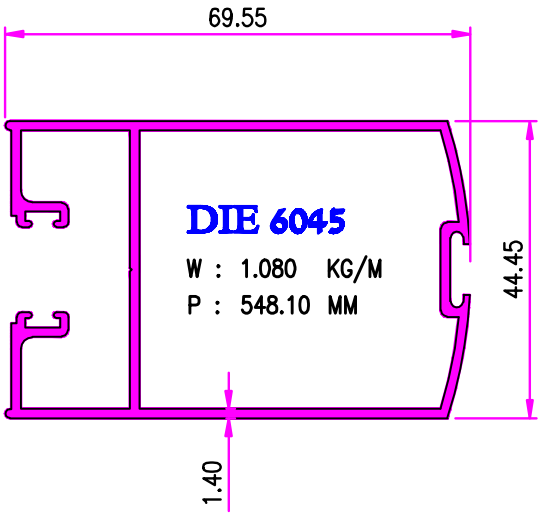
DIE 6062
W : 0.165 KG/M
P : 119.65 MM

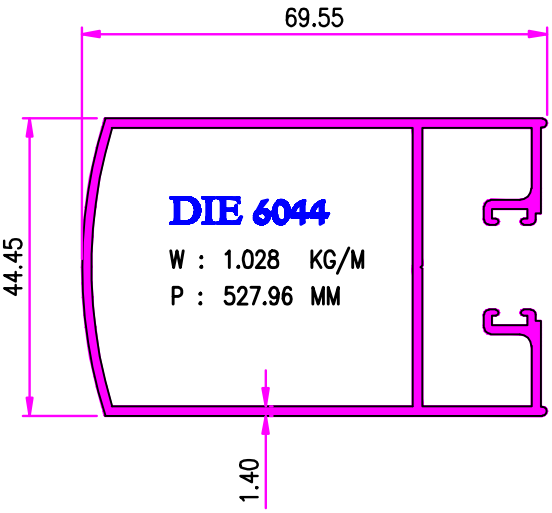


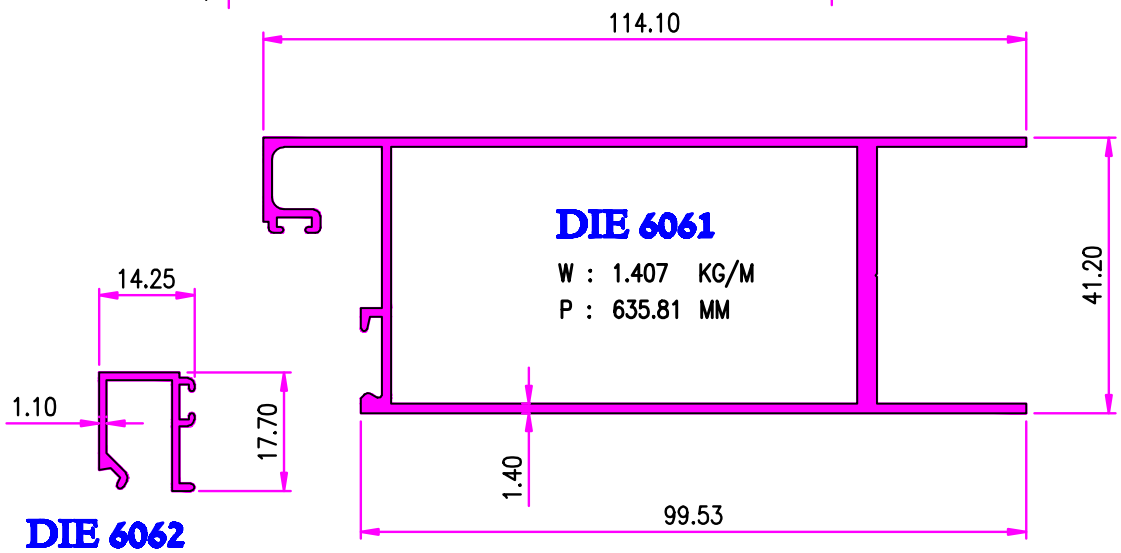


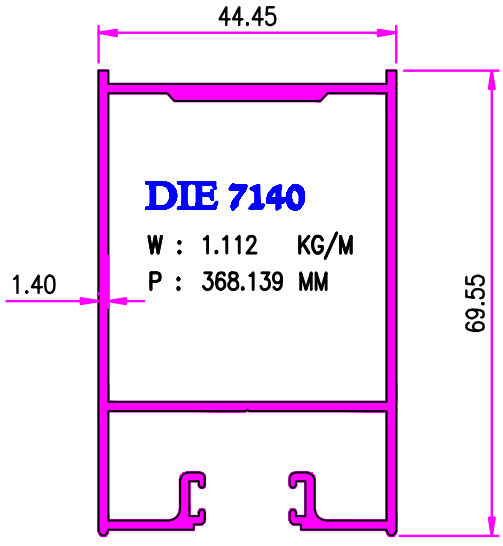
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

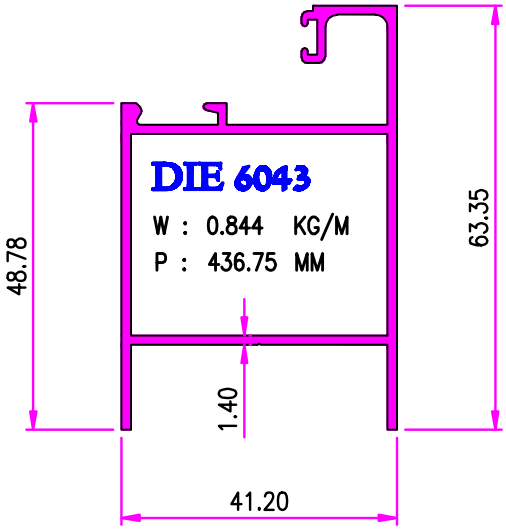
SWING DOOR X 1.40 MM THICK **GROUP : 8C-1**



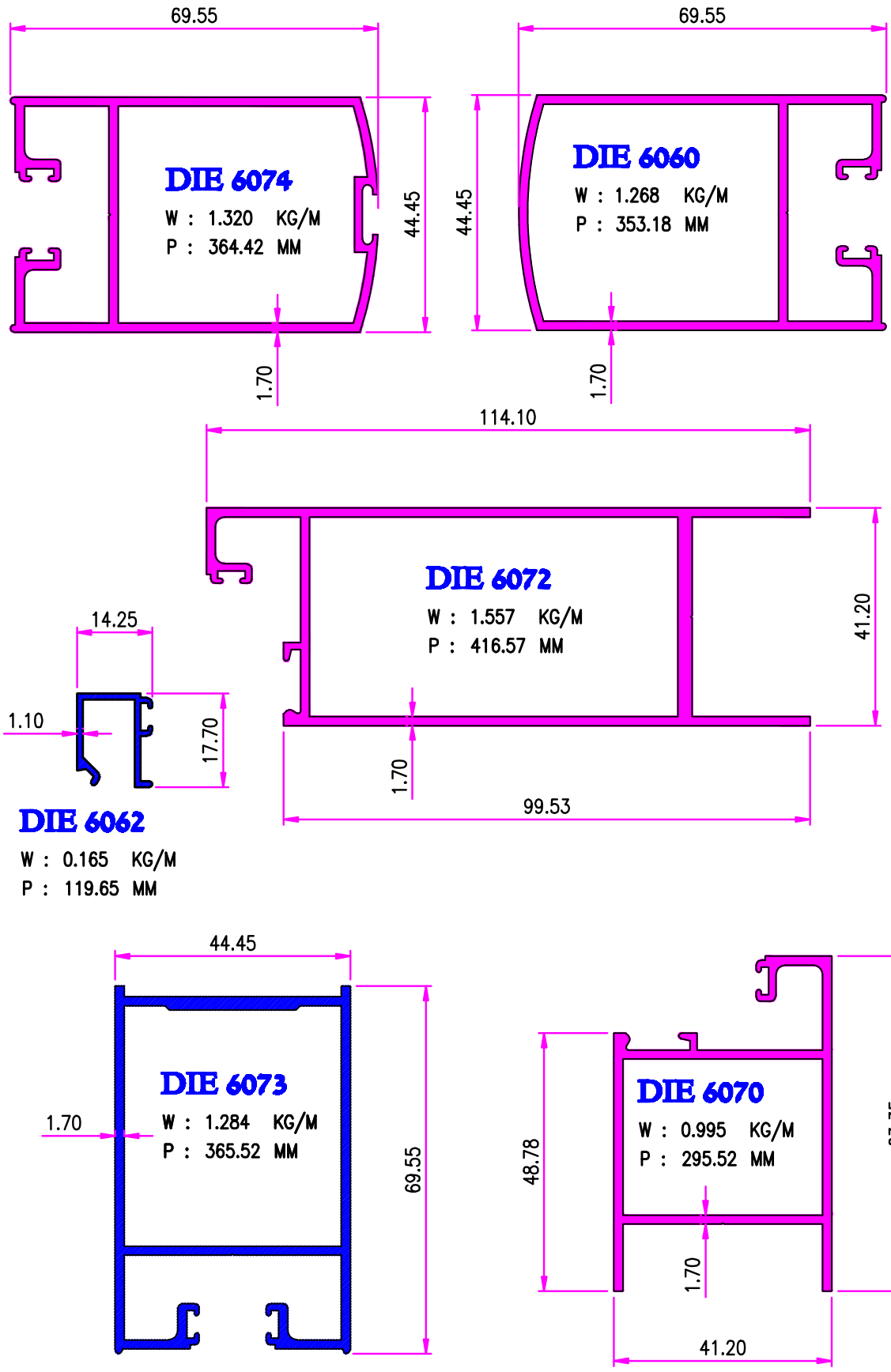






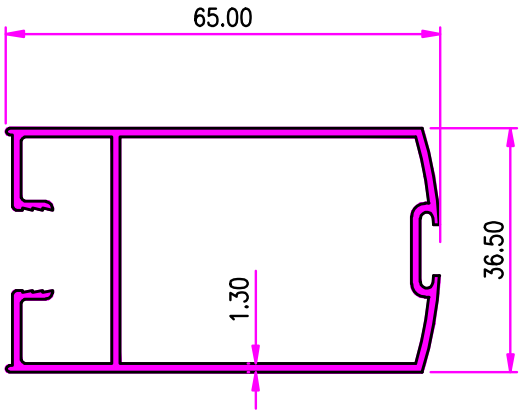


SWING DOOR X 1.70 MM THICK **GROUP : SD-1**



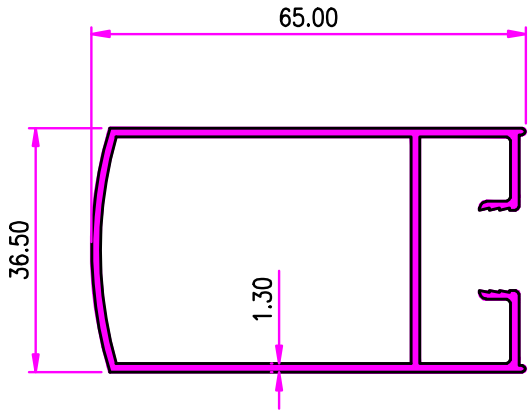
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

ECONOMY SWING DOOR X 1.30 MM THICK **GROUP : 8E-1**



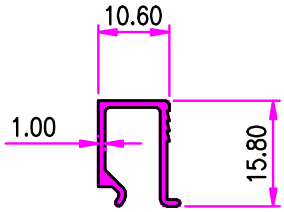
DIE 1663

W : 0.801 KG/M
P : 303.21 MM



DIE 1662

W : 0.784 KG/M
P : 291.54 MM

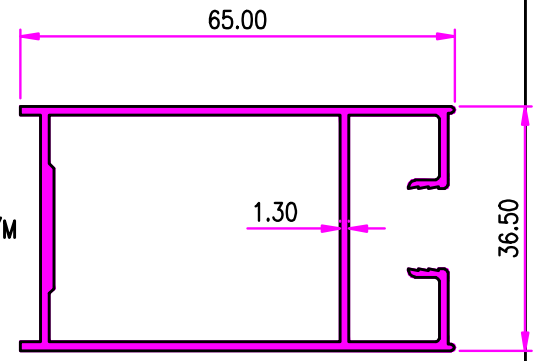


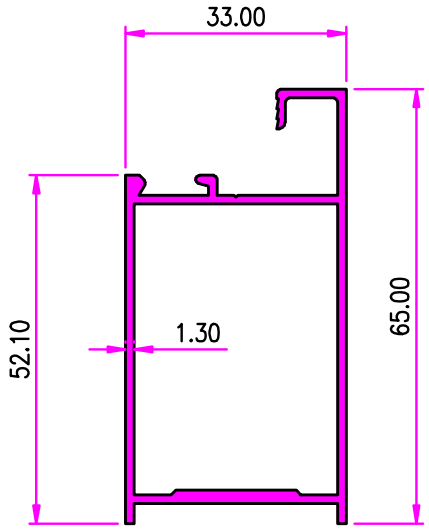
DIE 1664

W : 0.125 KG/M
P : 89.43 MM

DIE 1665

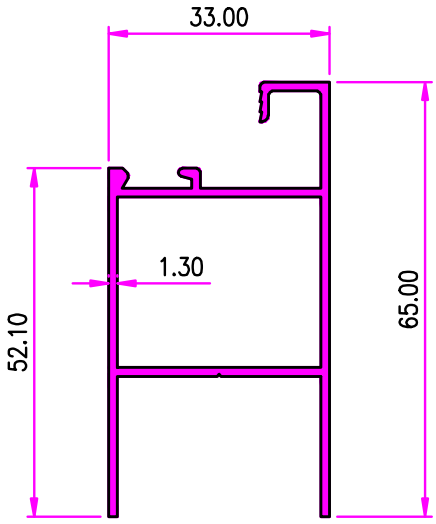
W : 0.836 KG/M
P : 302.37 MM





DIE 1666

W : 0.736 KG/M
P : 245.40 MM

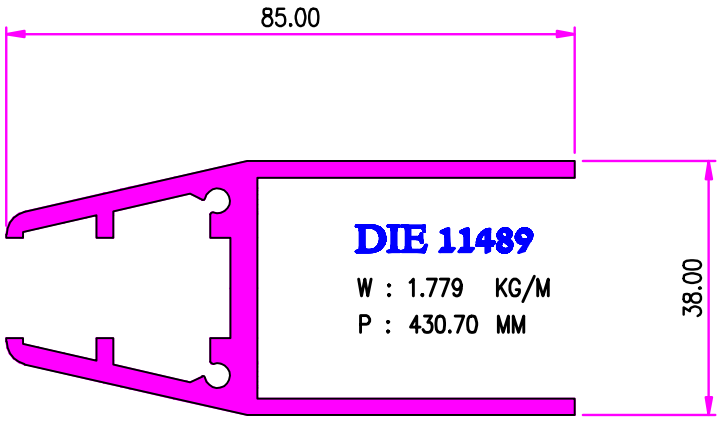


DIE 1661

W : 0.701 KG/M
P : 281.40 MM

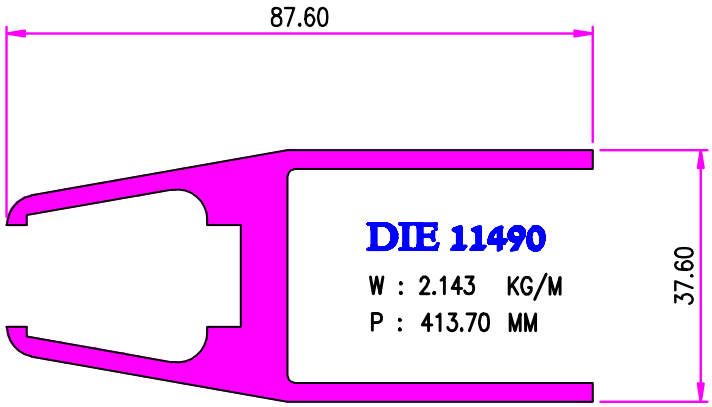
FRAME LESS DOOR SECTIONS

GROUP : 8F-1



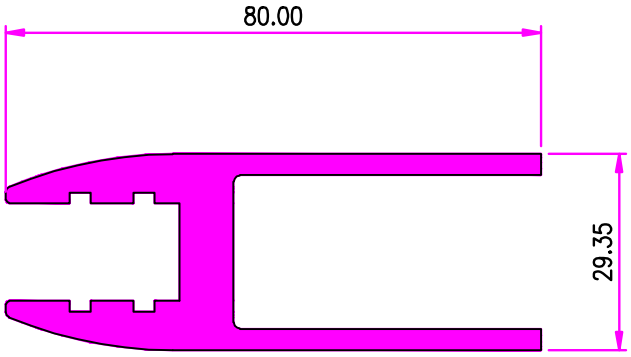
DIE 11489

W : 1.779 KG/M
P : 430.70 MM



DIE 11490

W : 2.143 KG/M
P : 413.70 MM

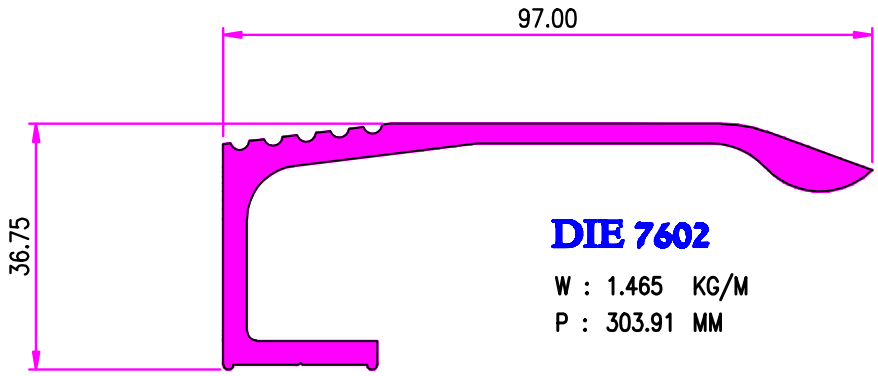


DIE 777

W : 2.184 KG/M
P : 365.02 MM

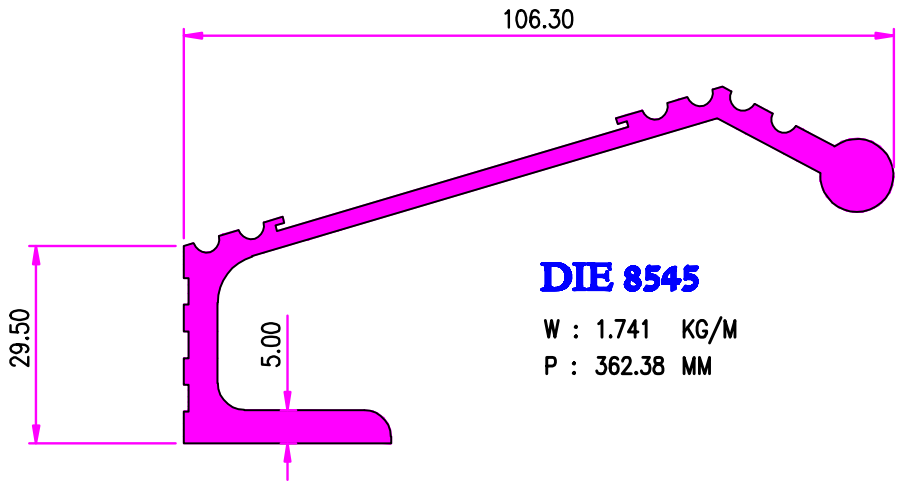
DOOR HANDLE SECTIONS

GROUP : 8G-1



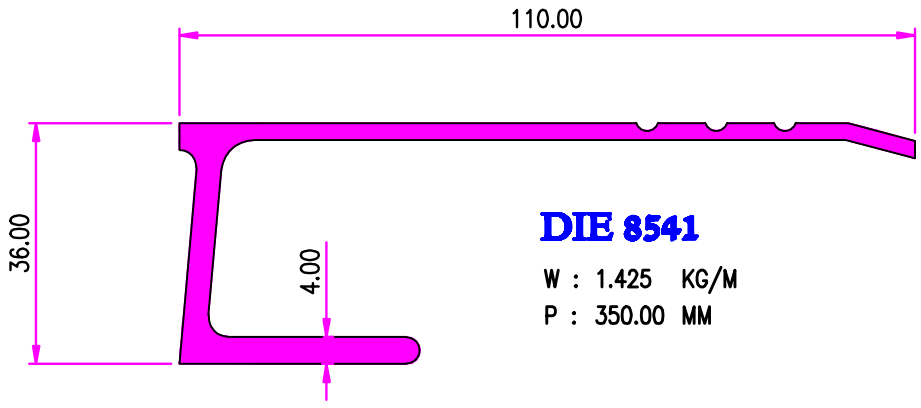
DIE 7602

W : 1.465 KG/M
P : 303.91 MM



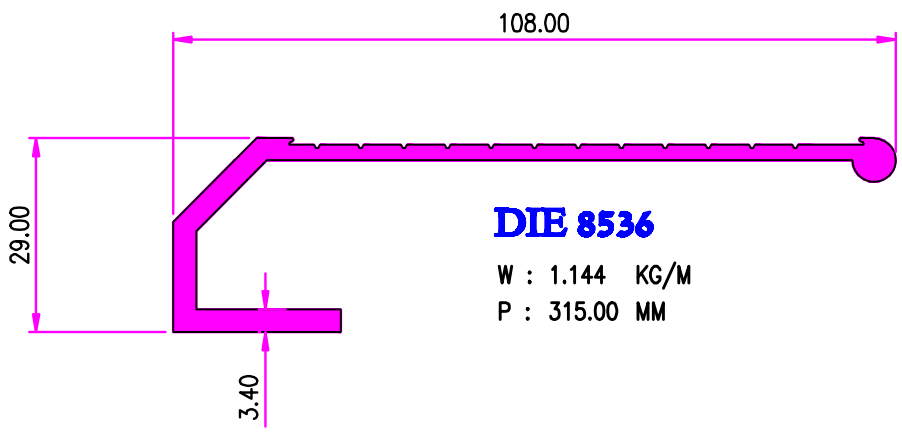
DIE 8545

W : 1.741 KG/M
P : 362.38 MM



DIE 8541

W : 1.425 KG/M
P : 350.00 MM

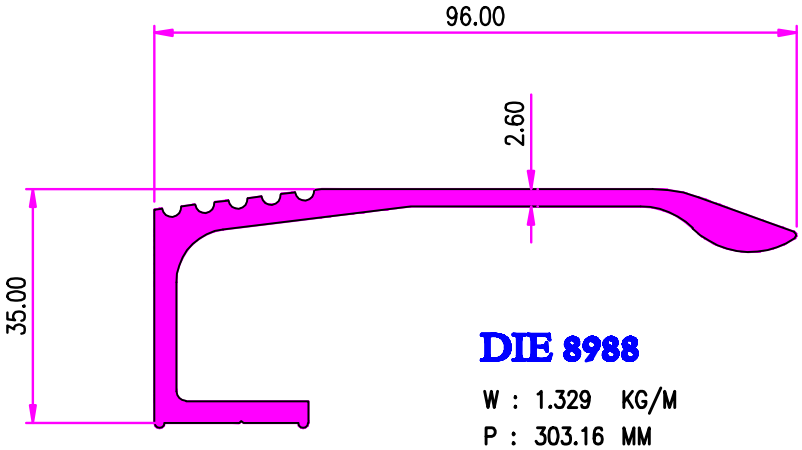


DIE 8536

W : 1.144 KG/M
P : 315.00 MM

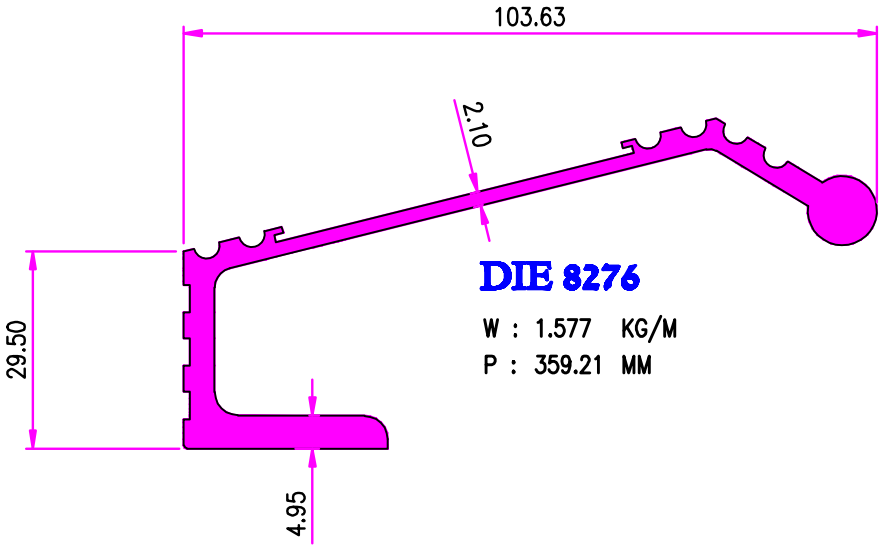
DOOR HANDLE SECTIONS

GROUP : 8G-2



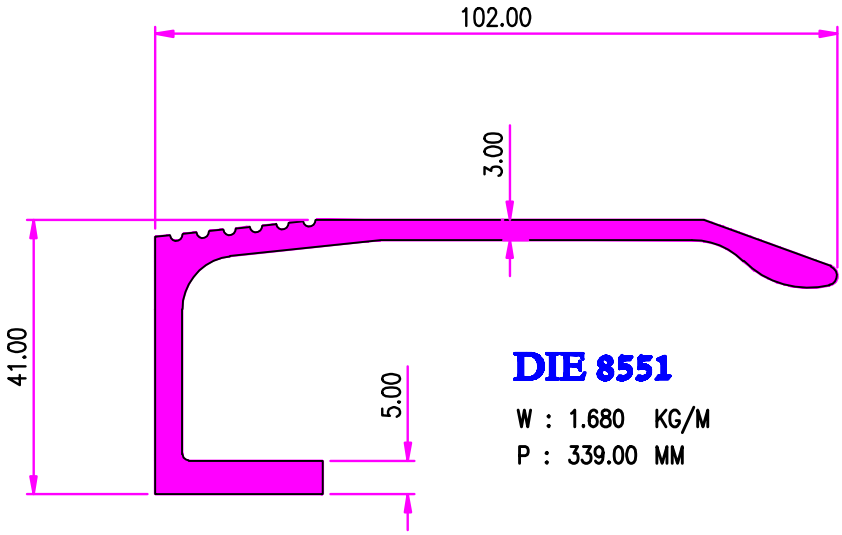
DIE 8988

W : 1.329 KG/M
P : 303.16 MM



DIE 8276

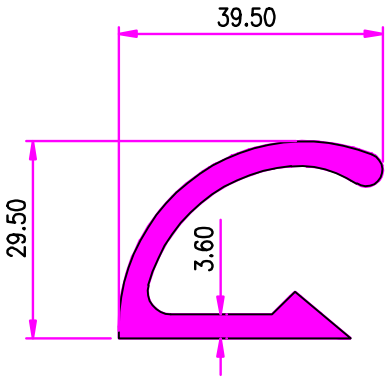
W : 1.577 KG/M
P : 359.21 MM



DIE 8551

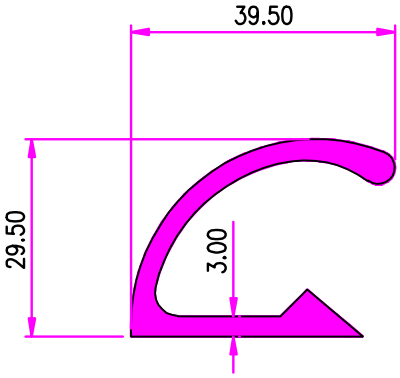
W : 1.680 KG/M
P : 339.00 MM

DOOR HANDLE SECTIONS — GROUP : 8G-3



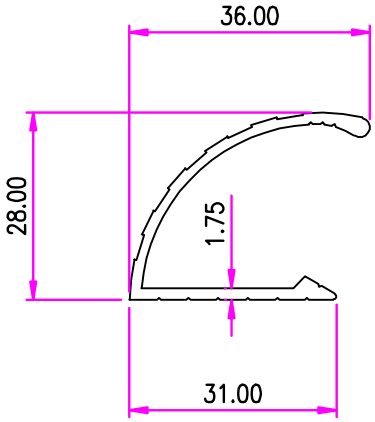
DIE 8542

W : 0.906 KG/M
P : 176.00 MM



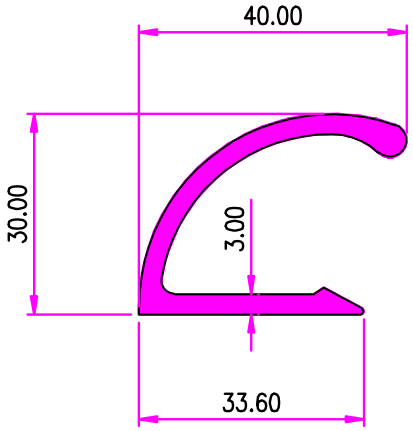
DIE 6724

W : 0.781 KG/M
P : 178.87 MM



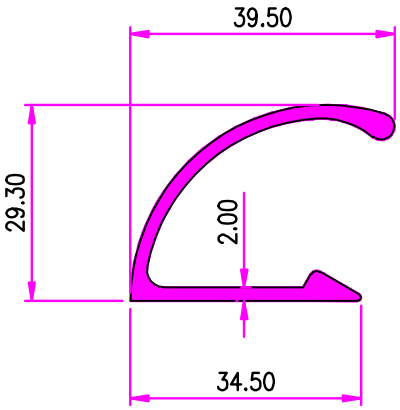
DIE 7916

W : 0.380 KG/M
P : 168.70 MM



DIE 8230

W : 0.721 KG/M
P : 176.25 MM



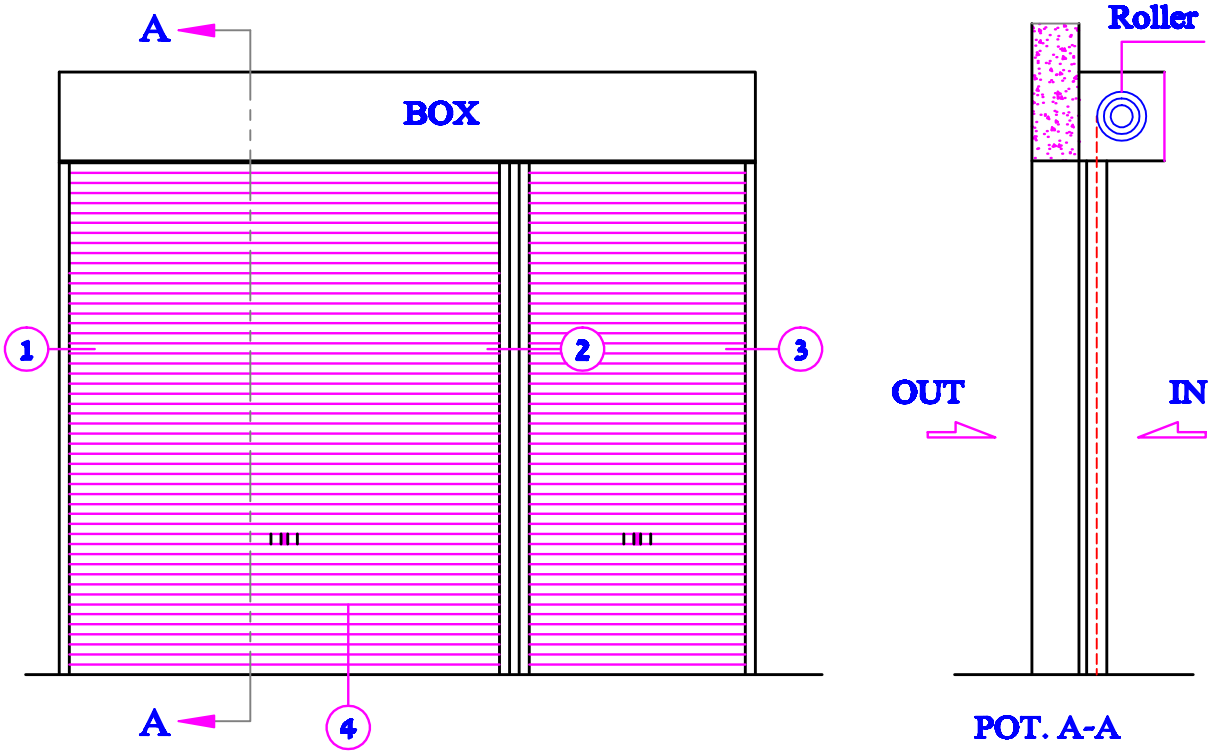
DIE 8991

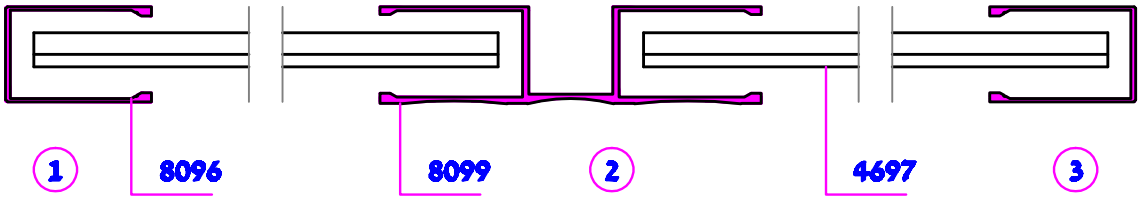
W : 0.526 KG/M
P : 178.81 MM

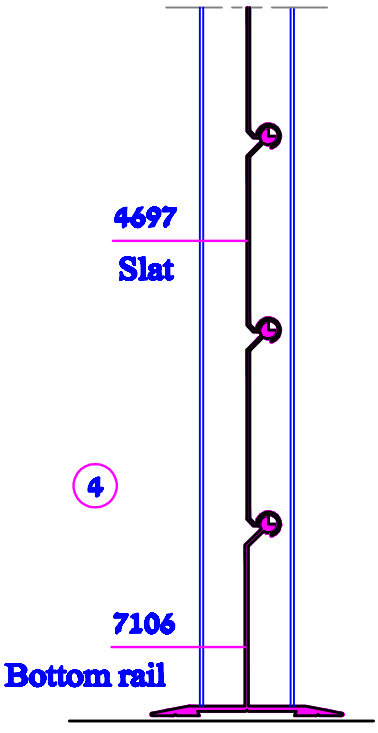
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

ROLLING DOOR ASSEMBLY DETAIL

GROUP : 9A-1

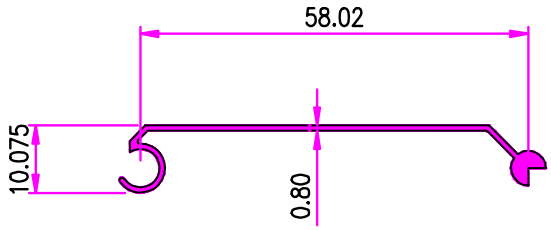




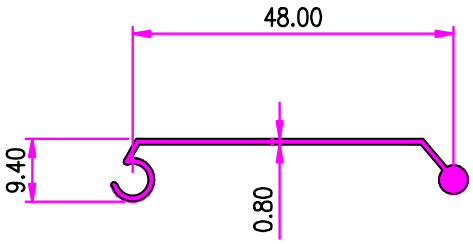


ROLLING DOOR 0.80 MM THICK

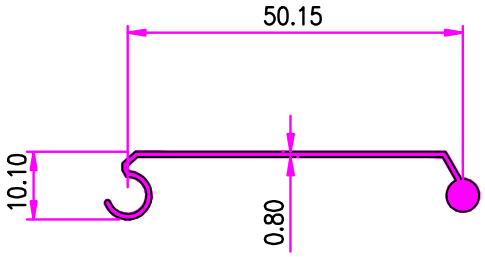
GROUP : 9B-1



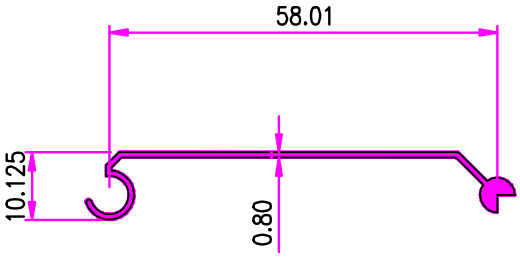
DIE 4632
W : 0.209 KG/M
P : 168.55 MM



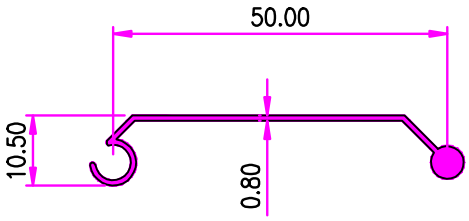
DIE 4688
W : 0.186 KG/M
P : 143.08 MM



DIE 4628
W : 0.201 KG/M
P : 153.50 MM



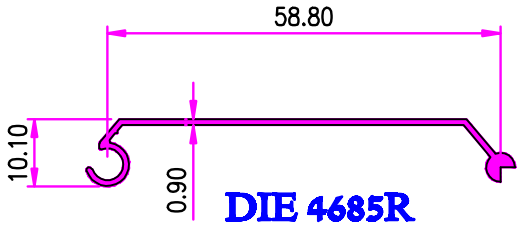
DIE 4697
W : 0.209 KG/M
P : 166.65 MM



DIE 7887
W : 0.199 KG/M
P : 149.34 MM

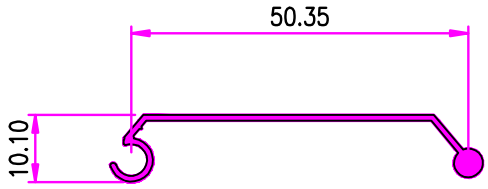
ROLLING DOOR 0.90 MM THICK

GROUP : 9C-1



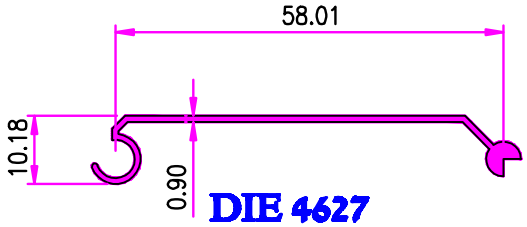
DIE 4685R

W : 0.216 KG/M
P : 165.67 MM



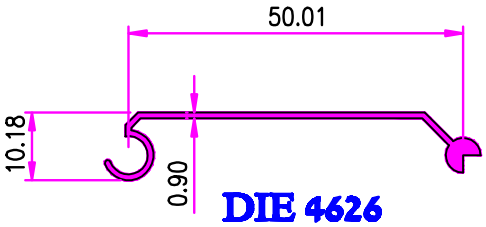
DIE 4686R

W : 0.206 KG/M
P : 147.76 MM



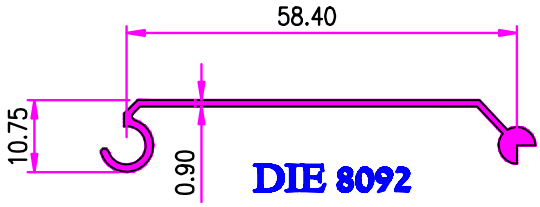
DIE 4627

W : 0.226 KG/M
P : 166.63 MM



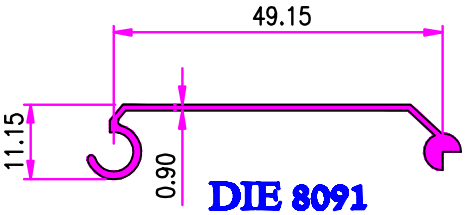
DIE 4626

W : 0.206 KG/M
P : 150.63 MM



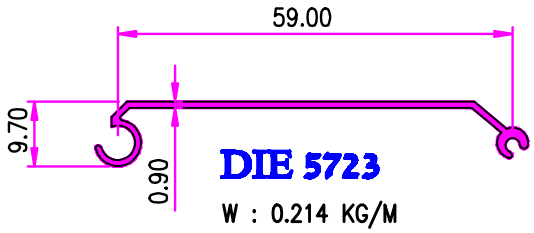
DIE 8092

W : 0.241 KG/M
P : 169.46 MM



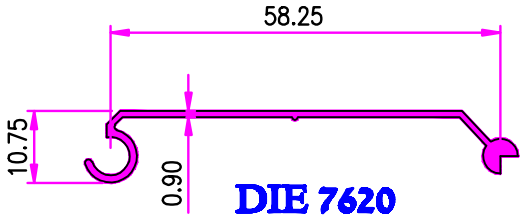
DIE 8091

W : 0.227 KG/M
P : 156.28 MM



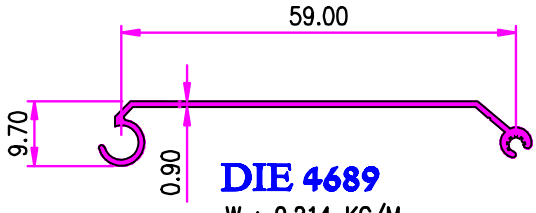
DIE 5723

W : 0.214 KG/M
P : 169.48 MM



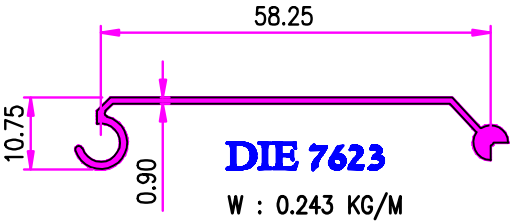
DIE 7620

W : 0.243 KG/M
P : 170.00 MM



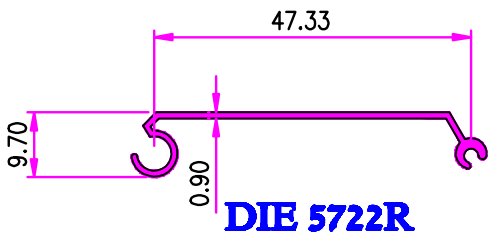
DIE 4689

W : 0.214 KG/M
P : 173.31 MM



DIE 7623

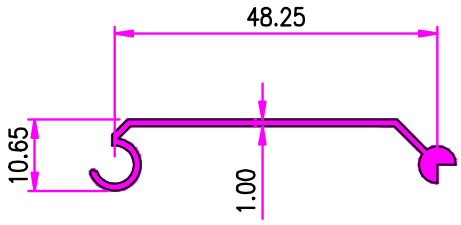
W : 0.243 KG/M
P : 170.00 MM



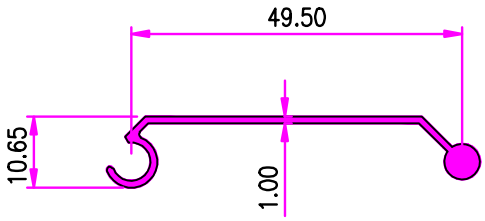
DIE 5722R

W : 0.193 KG/M
P : 151.52 MM

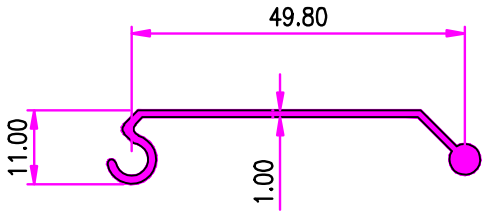
ROLLING DOOR 1.00 MM THICK — GROUP : 9D-1



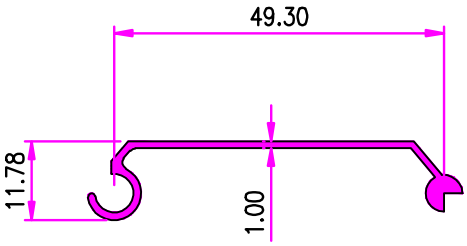
DIE 7203
W : 0.238 KG/M
P : 154.00 MM



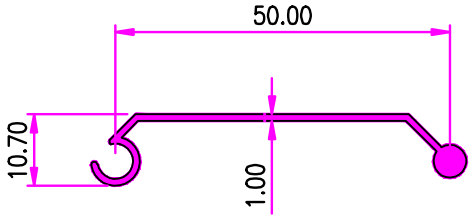
DIE 7204
W : 0.251 KG/M
P : 151.28 MM



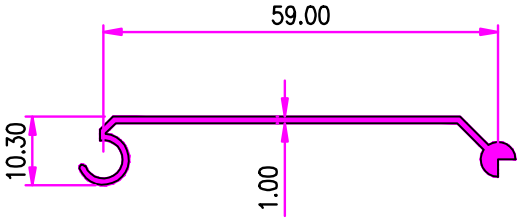
W : 0.252 KG/M
P : 149.00 MM



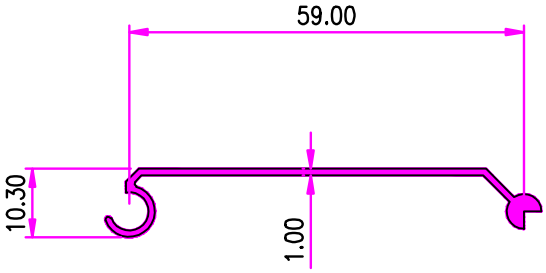
W : 0.250 KG/M
P : 150.00 MM



DIE 7886
W : 0.235 KG/M
P : 149.62 MM

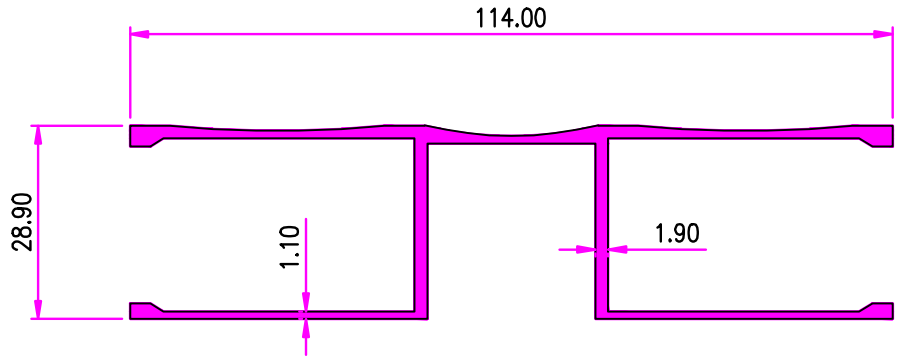


DIE 7104
W : 0.253 KG/M
P : 169.00 MM

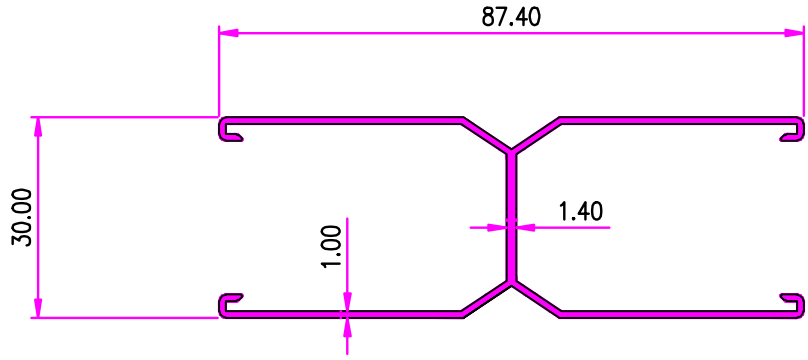


DIE 6834
W : 0.249 KG/M
P : 168.53 MM

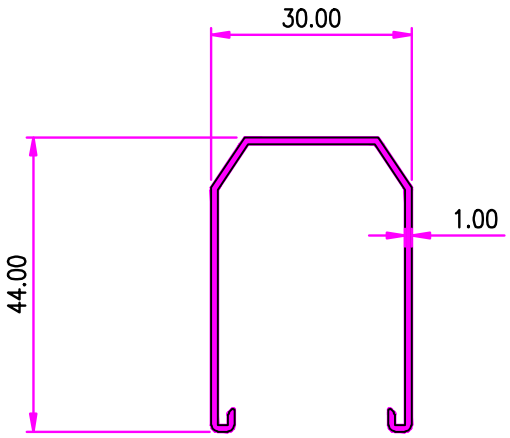
ROLLING DOOR SECTIONS — GROUP : 9E-1



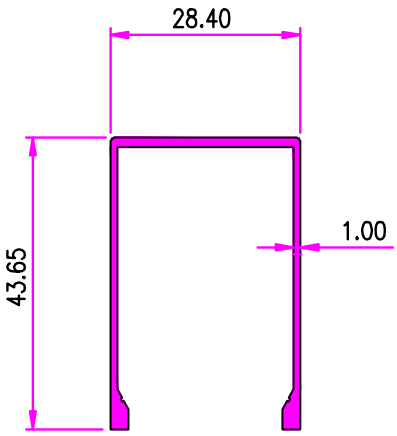
DIE 8099
W : 1.058 KG/M
P : 514.86 MM



DIE 4633
W : 0.606 KG/M
P : 434.39 MM



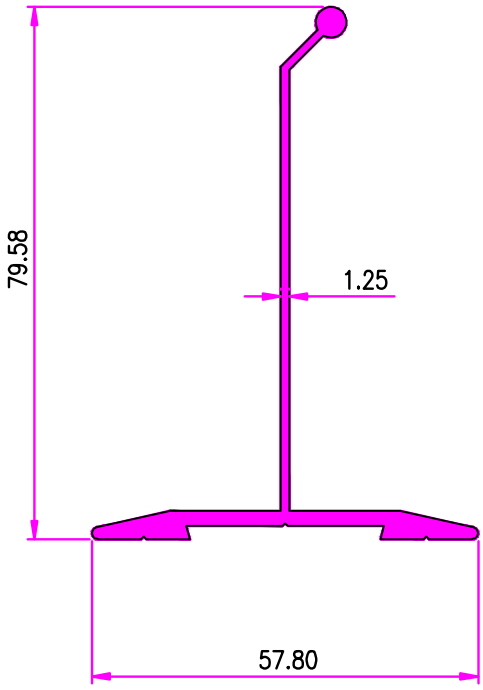
DIE 4634
W : 0.321 KG/M
P : 238.77 MM



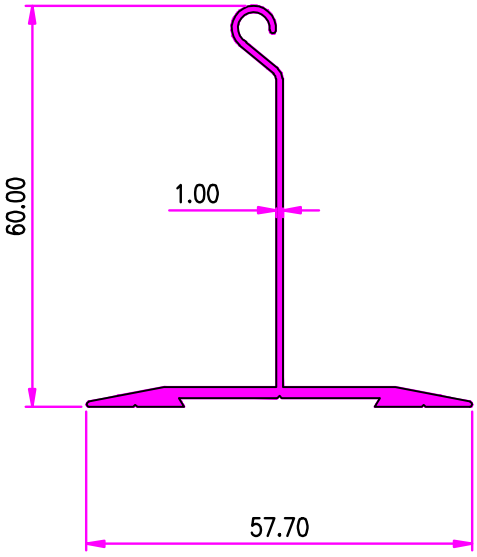
DIE 8096
W : 0.382 KG/M
P : 228.00 MM

ROLLING DOOR SECTIONS

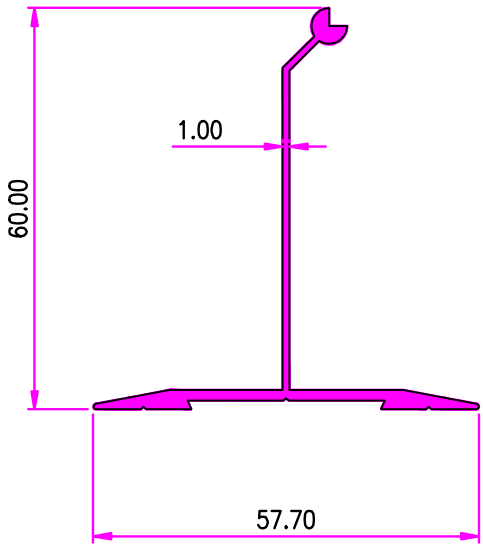
GROUP : 9E-2



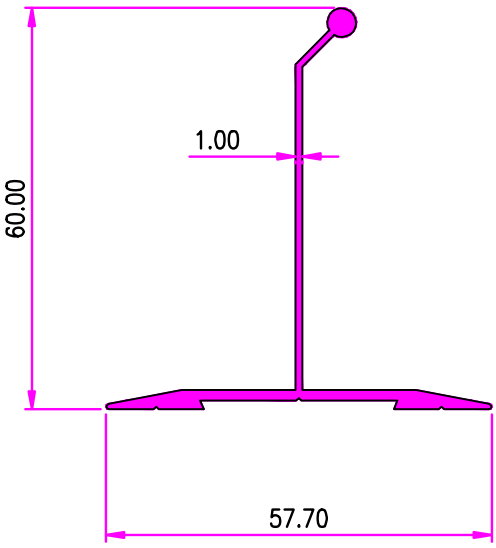
DIE 7105
W : 0.715 KG/M
P : 283.50 MM



DIE 8036
W : 0.483 KG/M
P : 256.40 MM



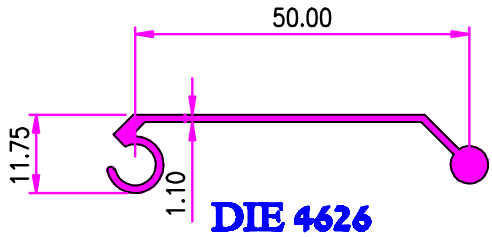
DIE 7106
W : 0.488 KG/M
P : 244.00 MM



DIE 4687
W : 0.474 KG/M
P : 244.28 MM

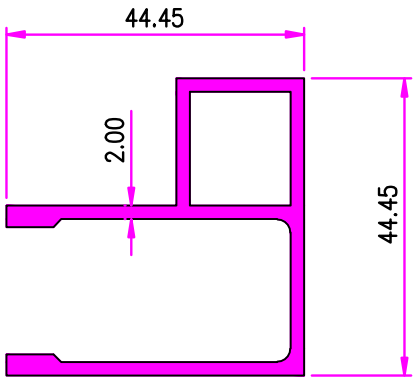
ROLLING DOOR SECTIONS

GROUP : 9E-3



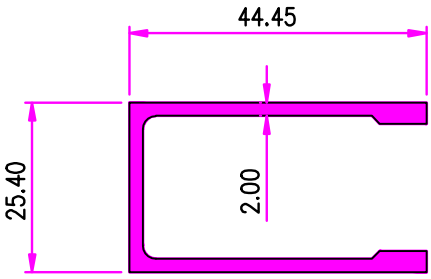
DIE 4626

W : 0.302 KG/M
P : 158.00 MM



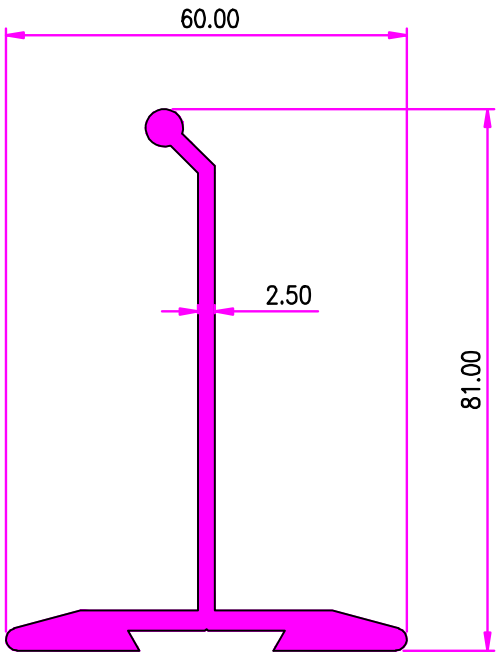
DIE 8744

W : 0.939 KG/M
P : 264.31 MM



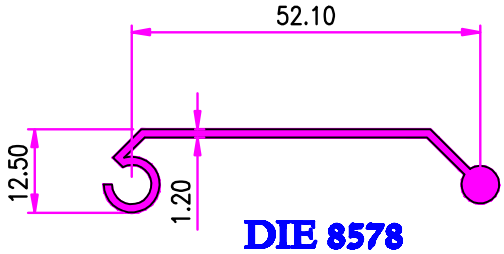
DIE 8331

W : 0.651 KG/M
P : 226.21 MM



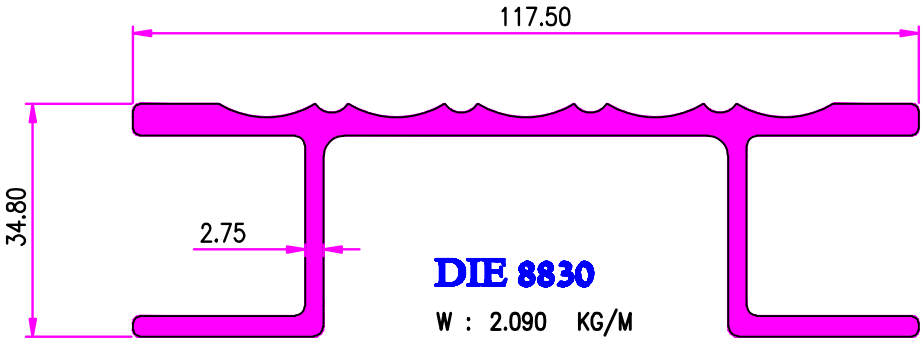
DIE 8745

W : 1.306 KG/M
P : 300.38 MM



DIE 8578

W : 0.352 KG/M
P : 160.00 MM

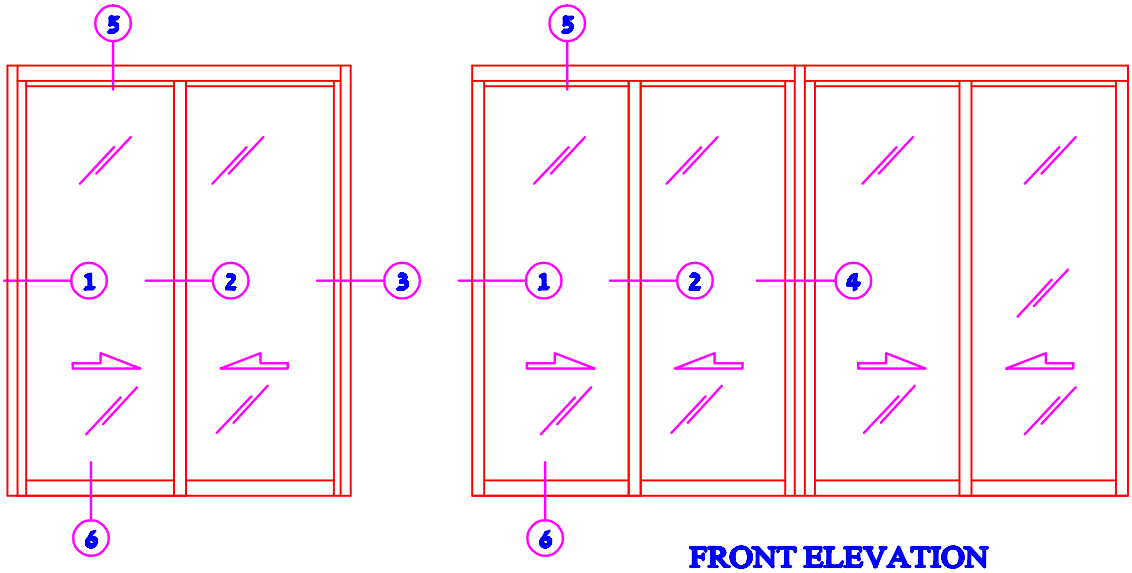


DIE 8830

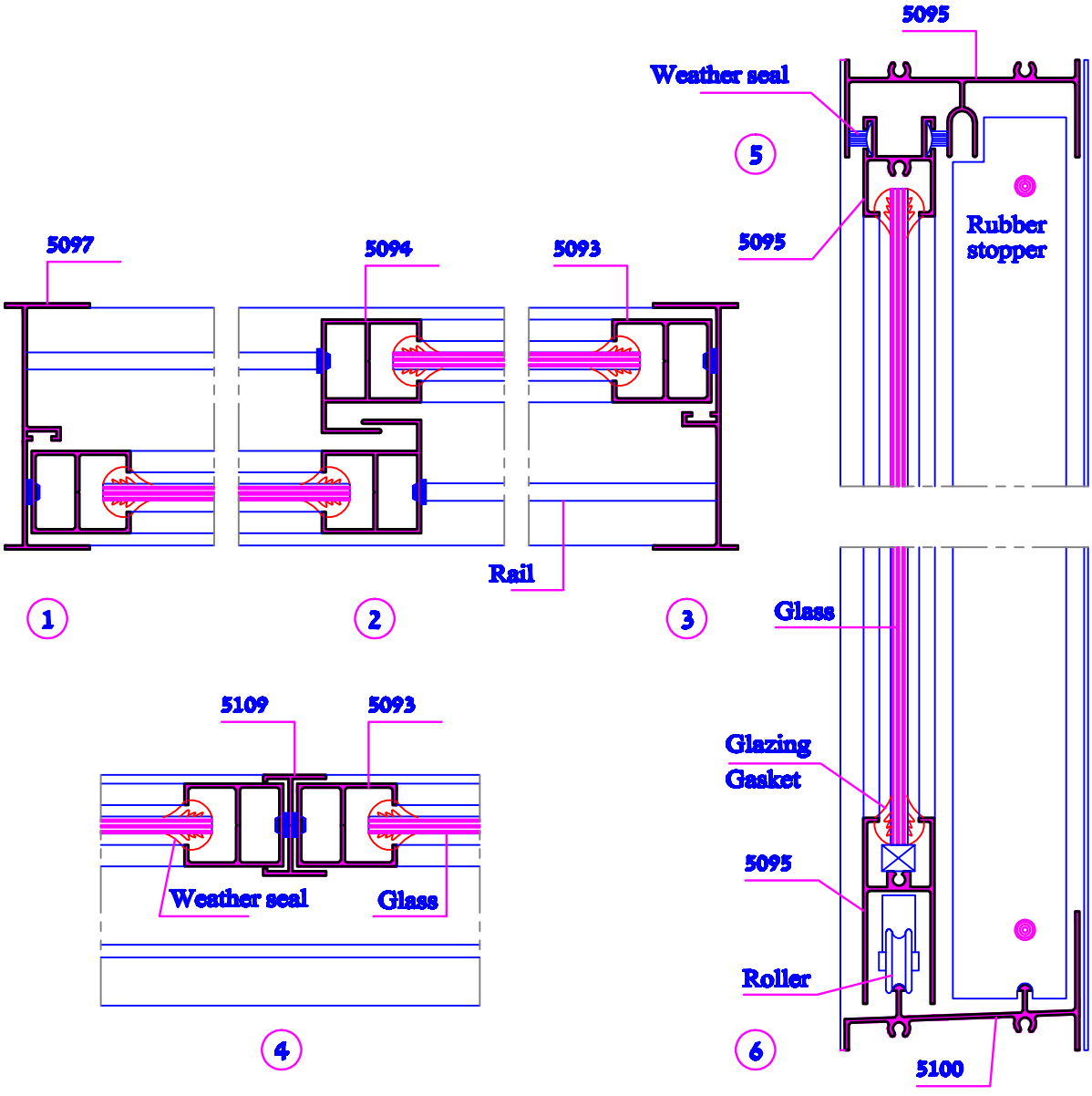
W : 2.090 KG/M
P : 582.06 MM

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SLIDING WINDOW ASSEMBLY DETAIL — GROUP : 10A-1

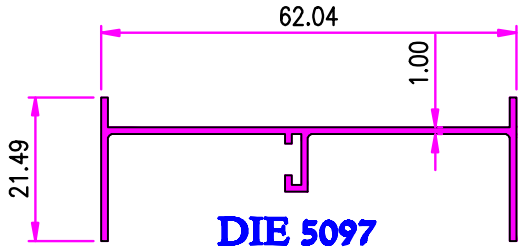


FRONT ELEVATION

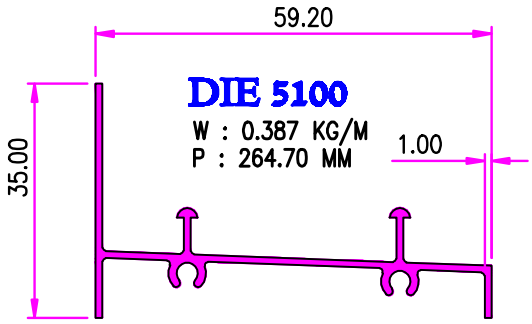


SLIDING WINDOW 1.00 MM THICK

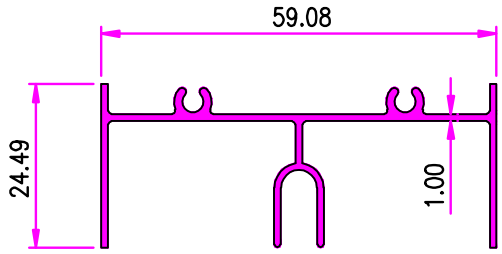
GROUP : 10B-1



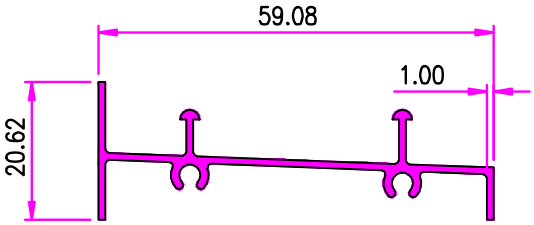
DIE 5097
W : 0.317 KG/M
P : 234.96 MM



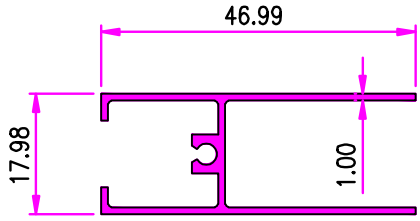
DIE 5100
W : 0.387 KG/M
P : 264.70 MM



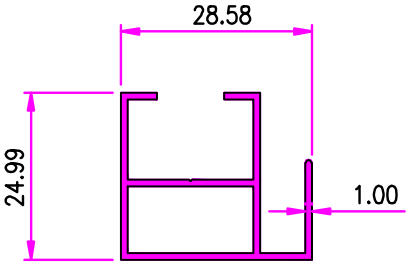
DIE 5098
W : 0.443 KG/M
P : 308.50 MM



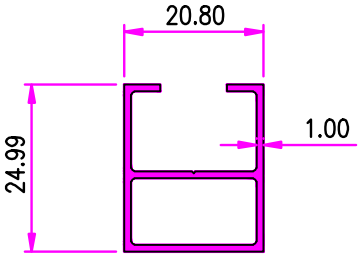
DIE 5099
W : 0.348 KG/M
P : 235.78 MM



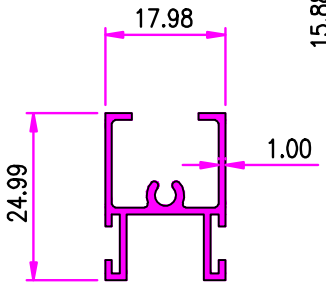
DIE 5095
W : 0.353 KG/M
P : 247.63 MM



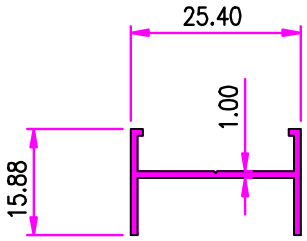
DIE 5094
W : 0.319 KG/M
P : 178.52 MM



DIE 5093
W : 0.262 KG/M
P : 134.53 MM



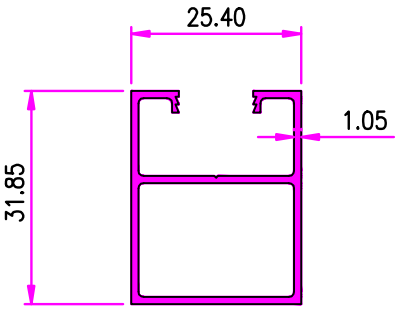
DIE 5096
W : 0.259 KG/M
P : 183.10 MM



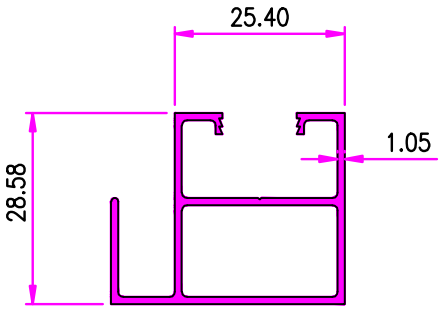
DIE 5109
W : 0.154 KG/M
P : 115.73 MM

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

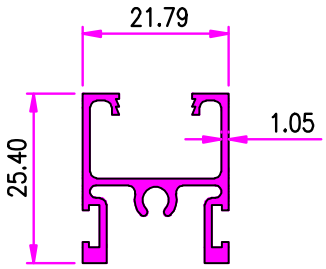
SLIDING WINDOW 1.05 MM THICK — GROUP : 10C-1



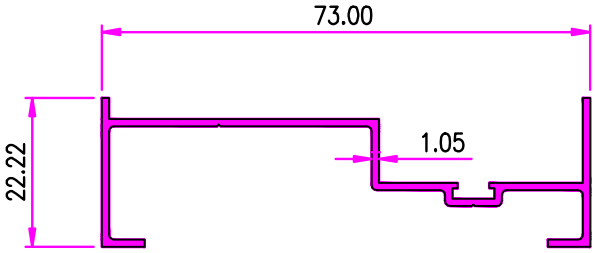
DIE 886
W : 0.367 KG/M
P : 173.56 MM



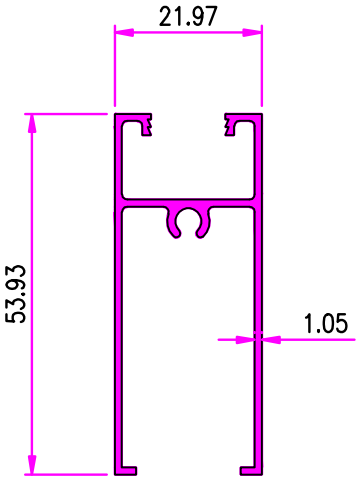
DIE 887
W : 0.417 KG/M
P : 208.88 MM



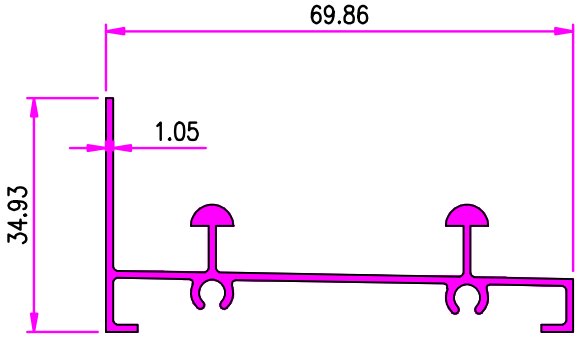
DIE 892
W : 0.334 KG/M
P : 222.68 MM



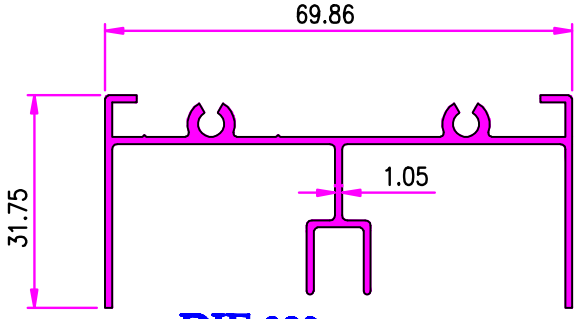
DIE 889
W : 0.412 KG/M
P : 279.80 MM



DIE 888
W : 0.457 KG/M
P : 310.18 MM



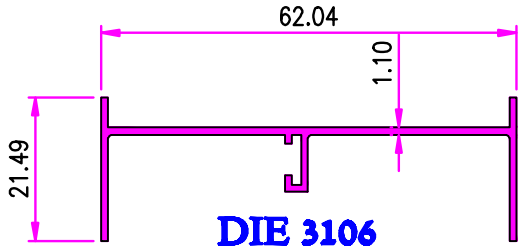
DIE 891
W : 0.545 KG/M
P : 314.00 MM



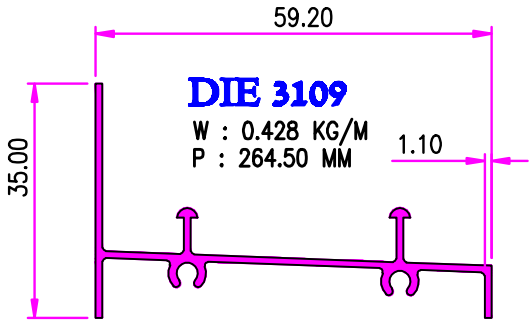
DIE 890
W : 0.585 KG/M
P : 382.30 MM

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

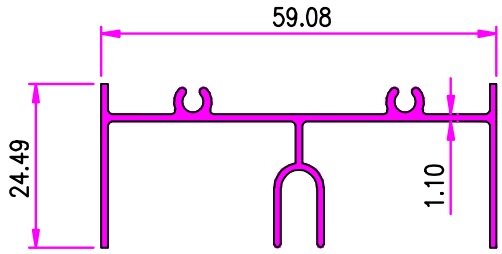
SLIDING WINDOW 1.10 MM THICK — GROUP : 10D-1



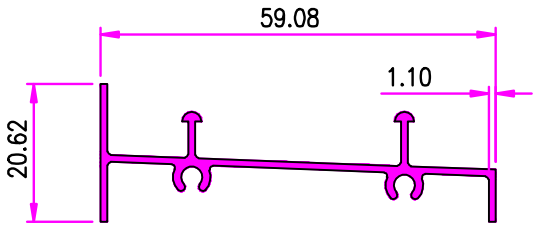
DIE 3106
W : 0.338 KG/M
P : 236.70 MM



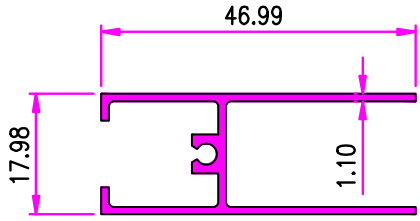
DIE 3109
W : 0.428 KG/M
P : 264.50 MM



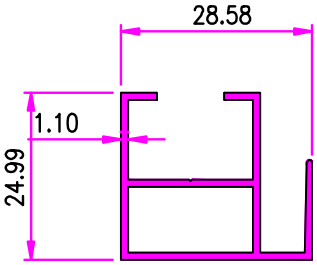
DIE 3107
W : 0.492 KG/M
P : 300.43 MM



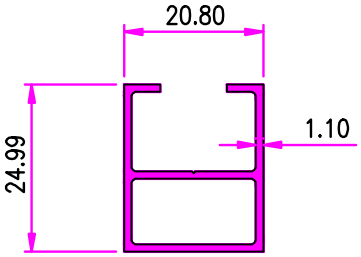
DIE 3108
W : 0.385 KG/M
P : 236.04 MM



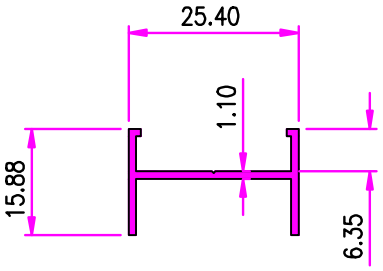
DIE 3104
W : 0.385 KG/M
P : 242.60 MM



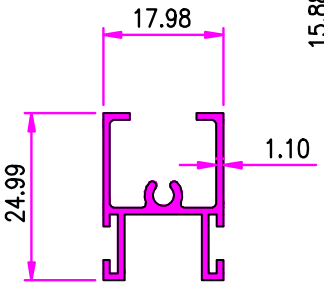
DIE 3103
W : 0.355 KG/M
P : 230.41 MM



DIE 3102
W : 0.290 KG/M
P : 189.97 MM



DIE 3101
W : 0.165 KG/M
P : 114.02 MM

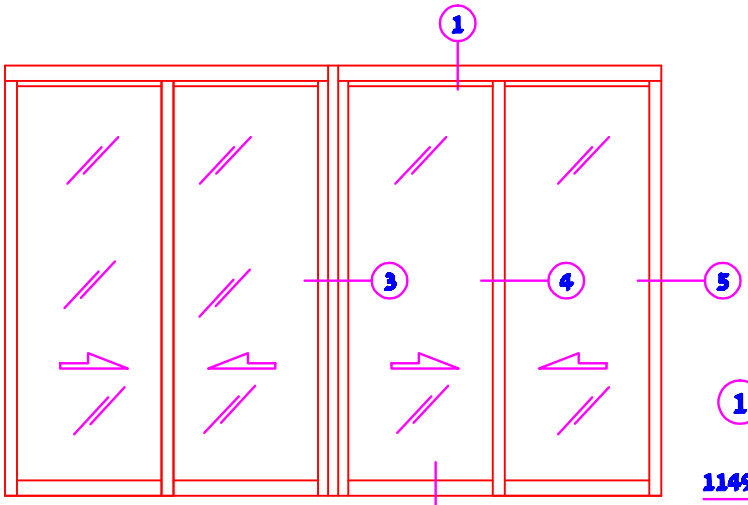


DIE 3105
W : 0.270 KG/M
P : 182.70 MM

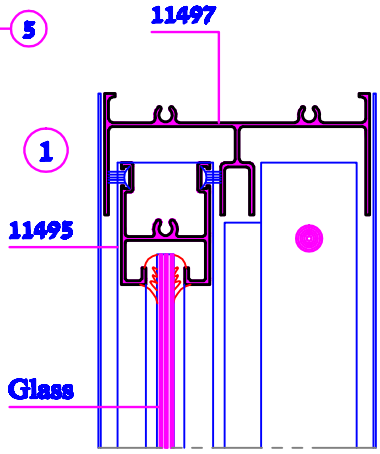
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

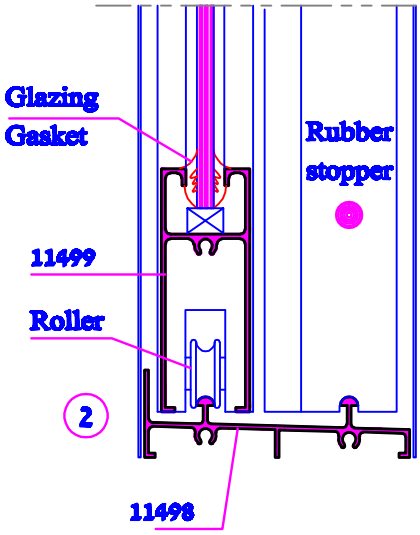
SLIDING DOOR ASSEMBLY DETAIL

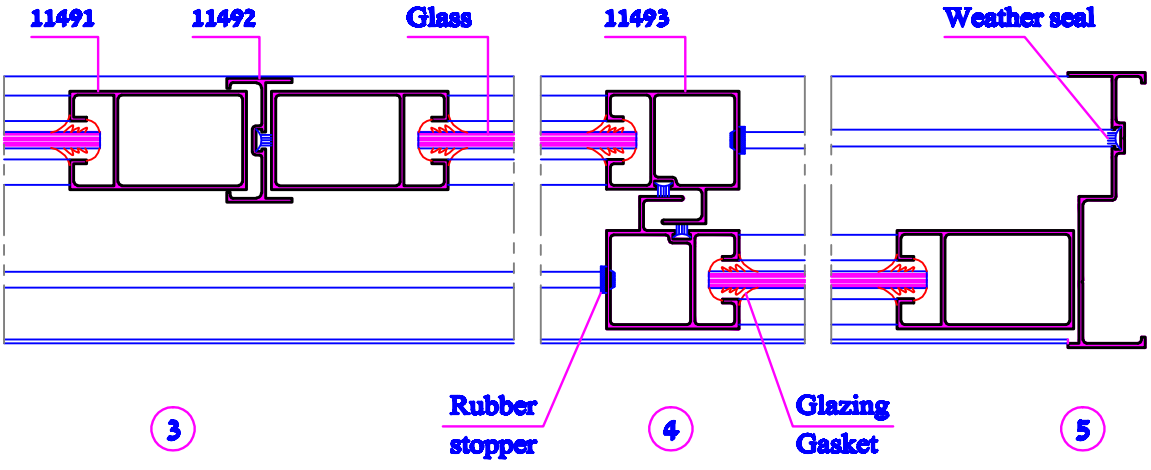
GROUP : 10E-1



FRONT ELEVATION

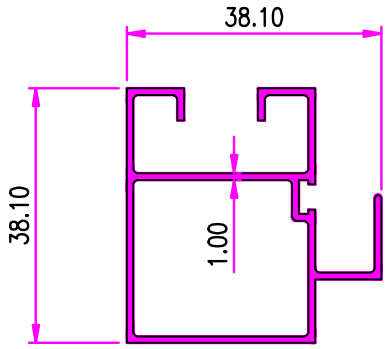




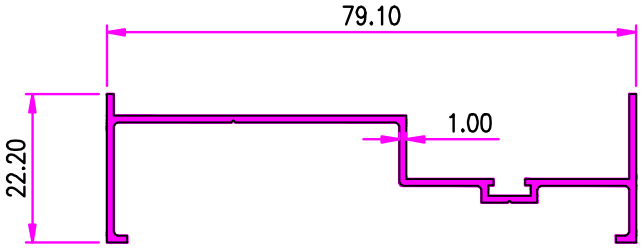


PT.ALEXINDO
(Aluminium Extrusions Indonesia)

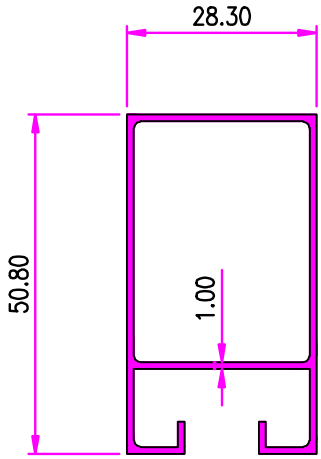
SLIDING DOOR 1.00 MM THICKNESS — GROUP : 10F-1



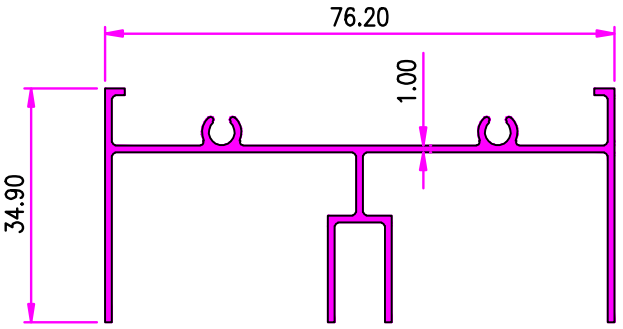
DIE 11281
W : 0.480 KG/M
P : 252.05 MM



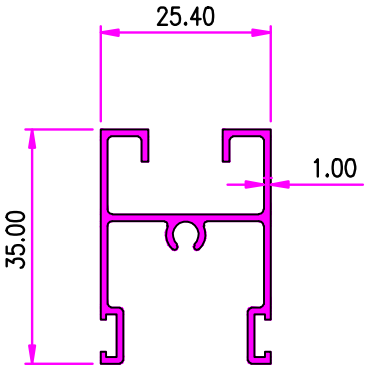
DIE 11284
W : 0.384 KG/M
P : 283.96 MM



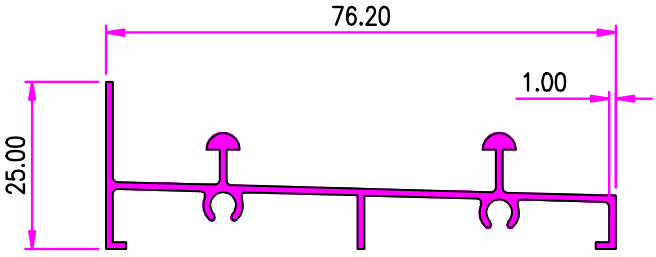
DIE 11282
W : 0.483 KG/M
P : 228.34 MM



DIE 11285
W : 0.590 KG/M
P : 425.48 MM

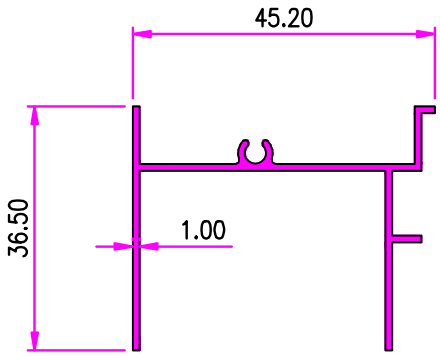


DIE 11283
W : 0.369 KG/M
P : 267.00 MM

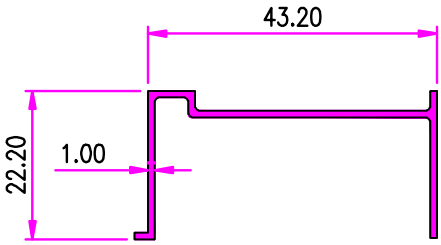


DIE 11286
W : 0.464 KG/M
P : 316.73 MM

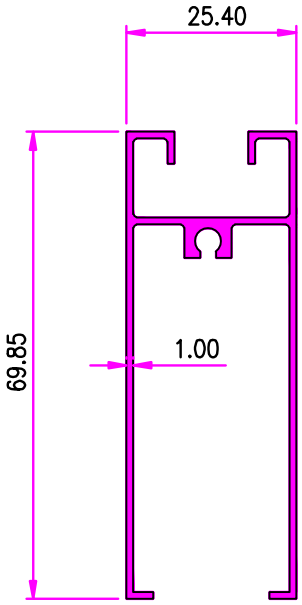
SLIDING DOOR 1.00 MM THICKNESS — GROUP : 10F-2



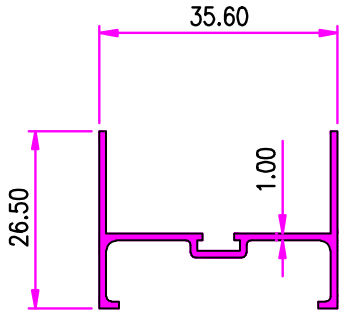
DIE 11289
W : 0.352 KG/M
P : 258.09 MM



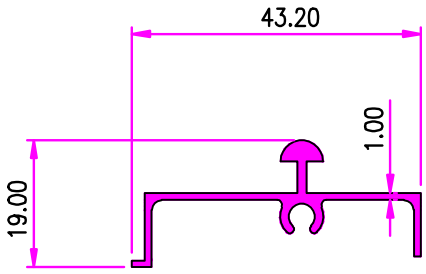
DIE 11291
W : 0.246 KG/M
P : 181.51 MM



DIE 11287
W : 0.570 KG/M
P : 397.31 MM



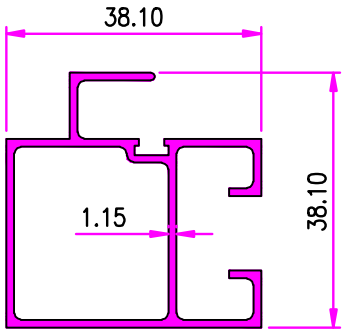
DIE 11288
W : 0.266 KG/M
P : 193.18 MM



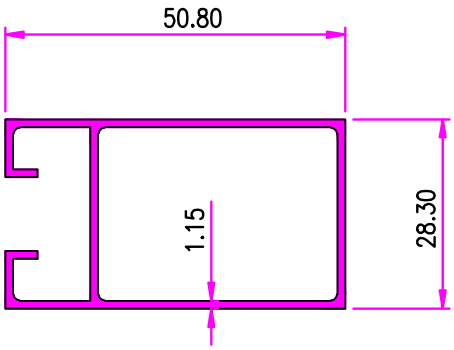
DIE 11295
W : 0.275 KG/M
P : 164.88 MM

PT.ALEXINDO
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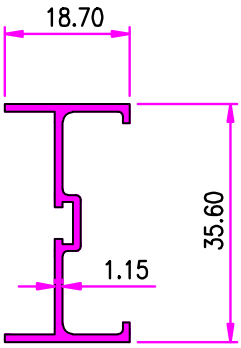
SLIDING DOOR 1.15 MM THICK — GROUP : 10G-1



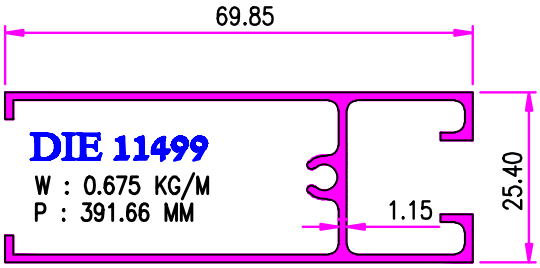
DIE 11493
W : 0.583 KG/M
P : 344.90 MM



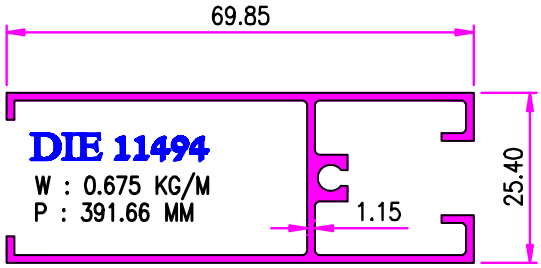
DIE 11492
W : 0.532 KG/M
P : 353.60 MM



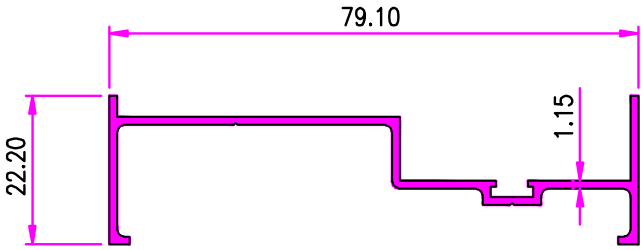
DIE 11491
W : 0.257 KG/M
P : 165.20 MM



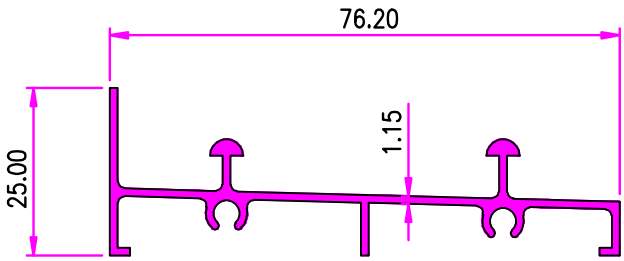
DIE 11499
W : 0.675 KG/M
P : 391.66 MM



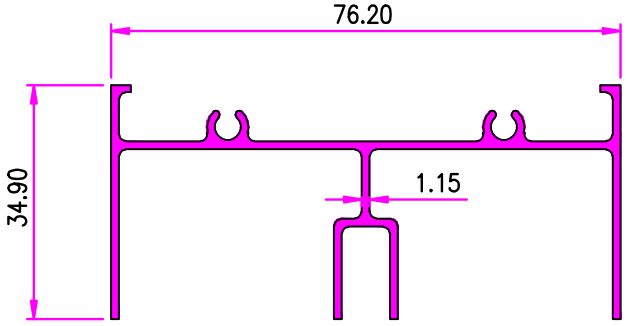
DIE 11494
W : 0.675 KG/M
P : 391.66 MM



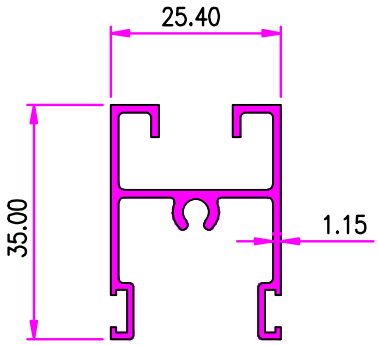
DIE 11496
W : 0.455 KG/M
P : 290.83 MM



DIE 11498
W : 0.593 KG/M
P : 305.60 MM



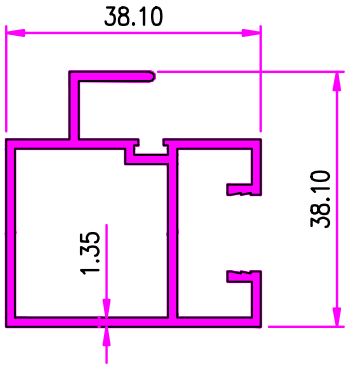
DIE 11497
W : 0.756 KG/M
P : 2425.25 MM



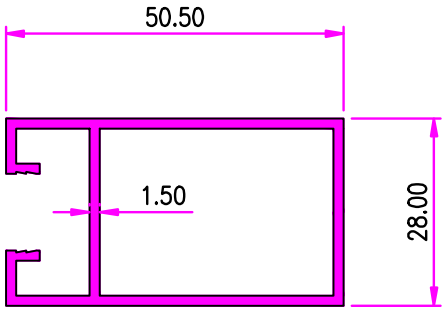
DIE 11495
W : 0.434 KG/M
P : 268.44 MM

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

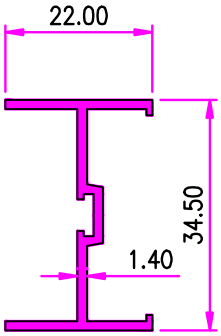
SLIDING DOOR 1.40 MM THICK — GROUP : 10H-1



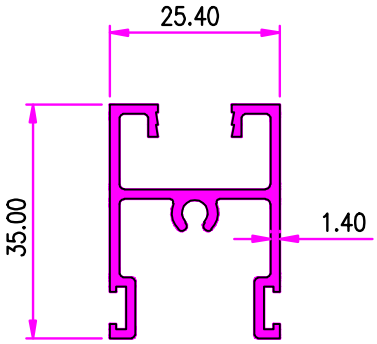
DIE 11533
W : 0.657 KG/M
P : 231.00 MM



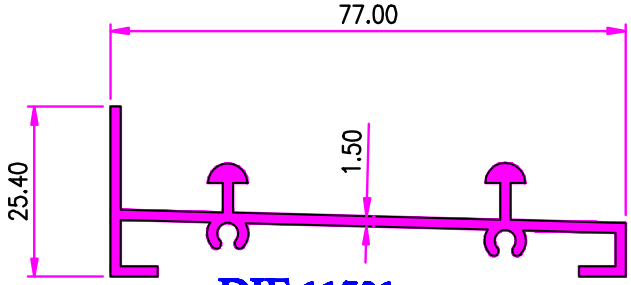
DIE 11522
W : 0.701 KG/M
P : 223.00 MM



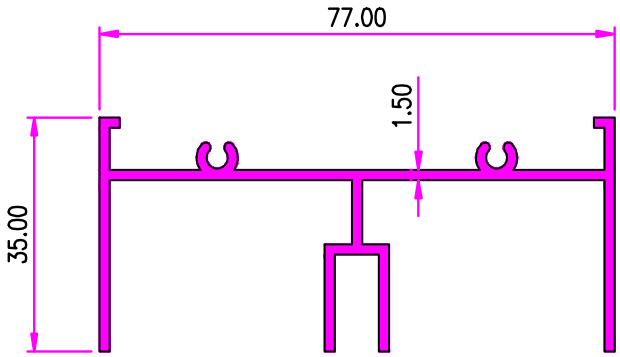
DIE 11529
W : 0.318 KG/M
P : 171.50 MM



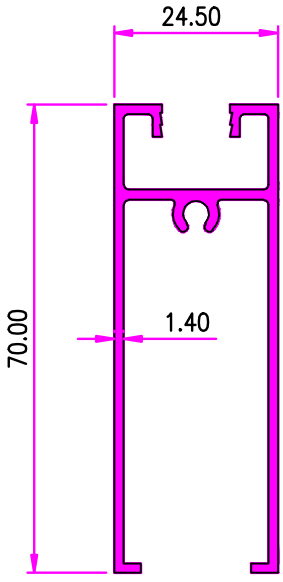
DIE 11527
W : 0.519 KG/M
P : 245.00 MM



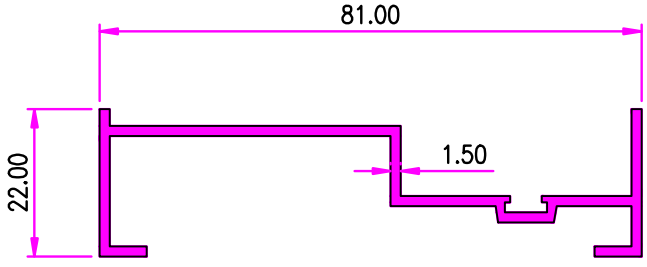
DIE 11531
W : 0.680 KG/M
P : 320.50 MM



DIE 11530
W : 0.894 KG/M
P : 414.00 MM

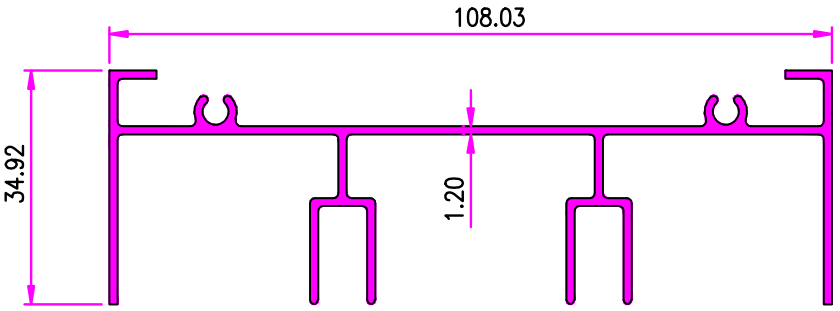


DIE 11528
W : 0.739 KG/M
P : 370.00 MM

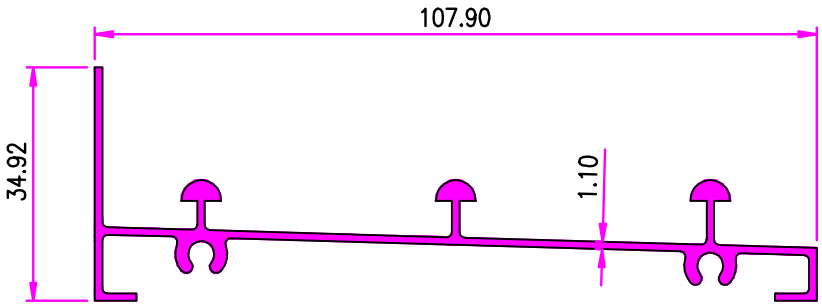


DIE 11532
W : 0.601 KG/M
P : 295.00 MM

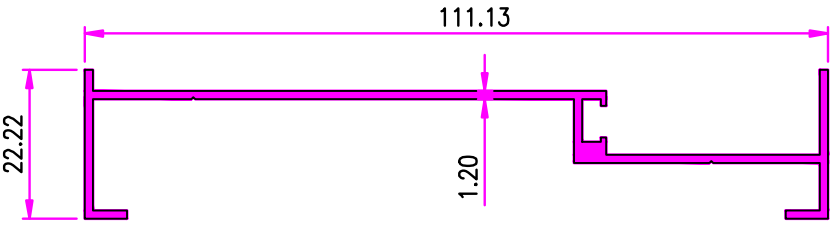
OTHERS **GROUP : 10I-1**



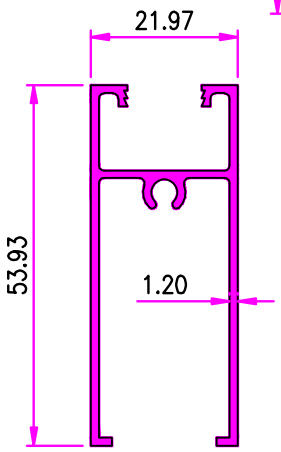
DIE 912
W : 0.999 KG/M
P : 608.50 MM



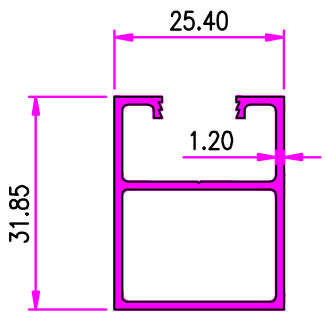
DIE 913
W : 0.795 KG/M
P : 430.80 MM



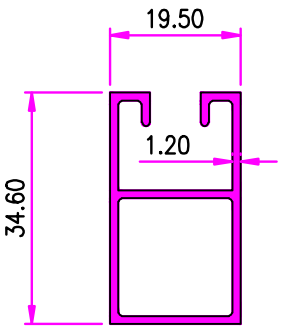
DIE 914
W : 0.587 KG/M
P : 356.40 MM



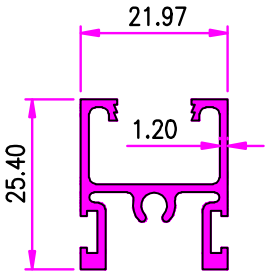
DIE 928
W : 0.501 KG/M
P : 310.18 MM



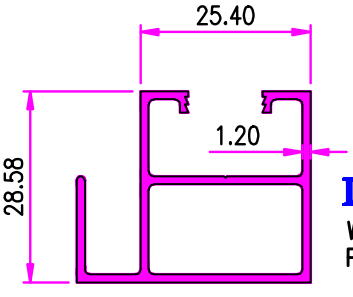
DIE 926
W : 0.410 KG/M
P : 173.56 MM



DIE 925
W : 0.397 KG/M
P : 171.60 MM



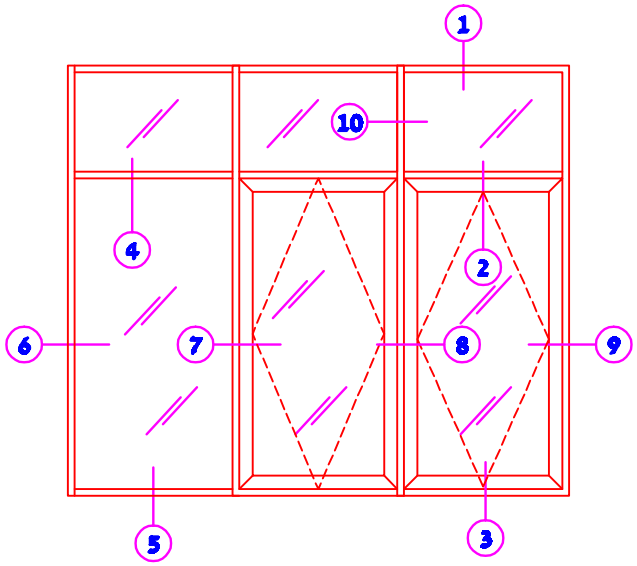
DIE 932
W : 0.384 KG/M
P : 222.68 MM



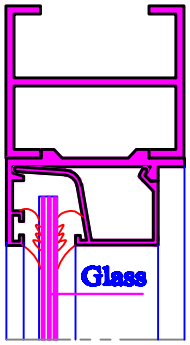
DIE 927
W : 0.469 KG/M
P : 208.88 MM

PT.ALEXINDO
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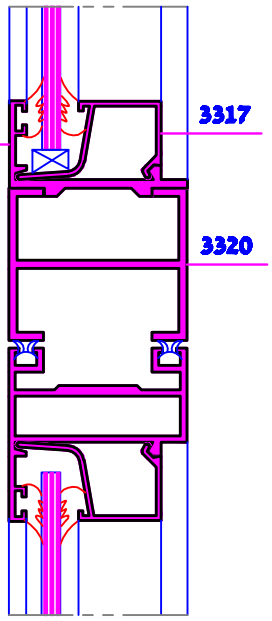
ECONOMY PIVOT WINDOW ASSEMBLY DETAIL — GROUP : 11A-1



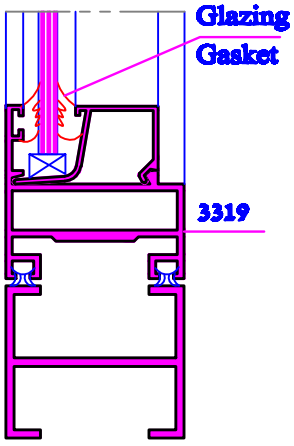
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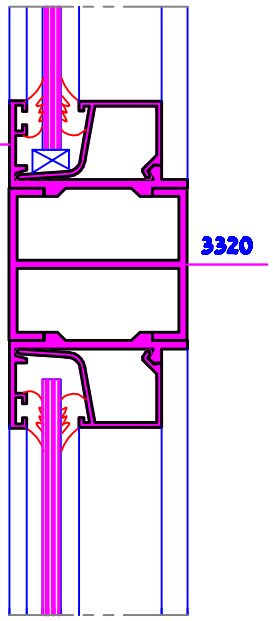
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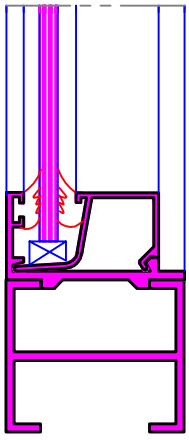
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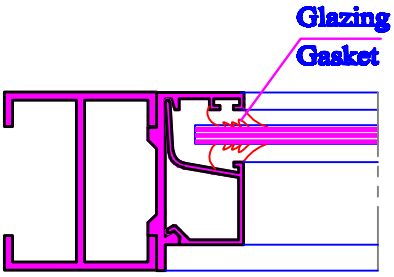


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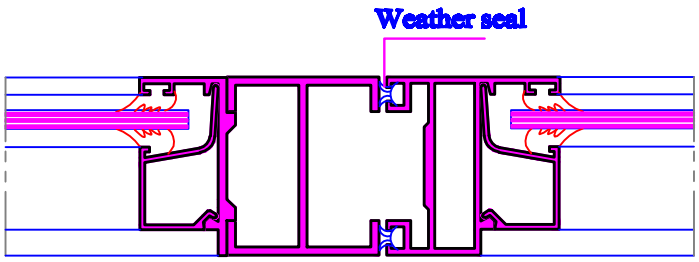


ECONOMY PIVOT WINDOW ASSEMBLY DETAIL

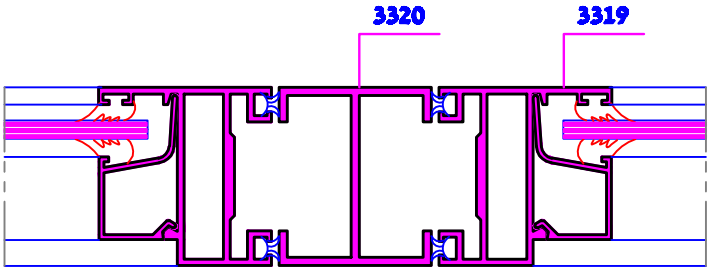
GROUP : 11A-2



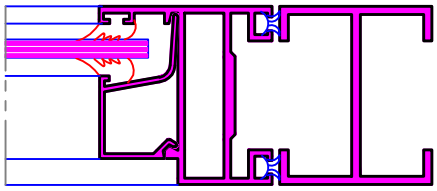
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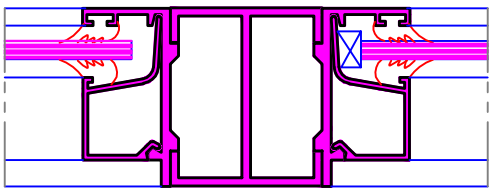
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8



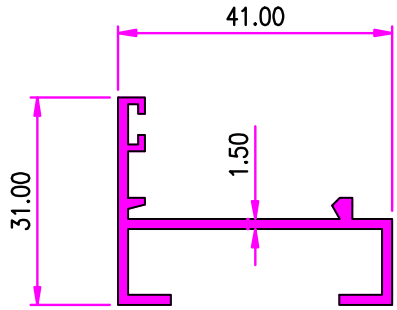
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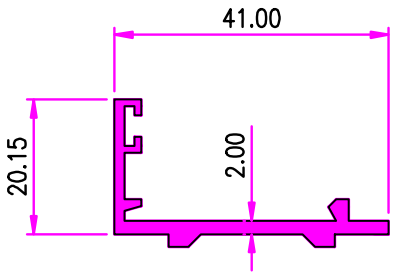
10

PT.ALEXINDO
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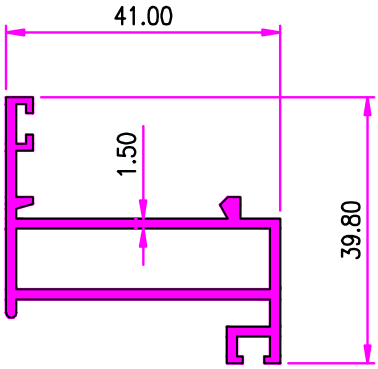
ECONOMY PIVOT WINDOW SECTIONS — GROUP : 11B-1



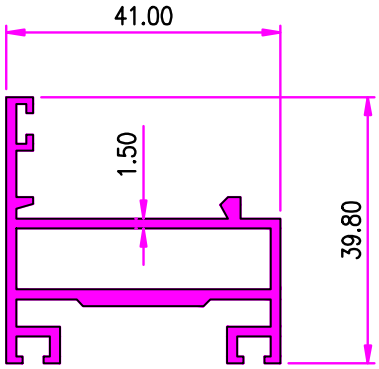
DIE 3316
W : 0.439 KG/M
P : 217.67 MM



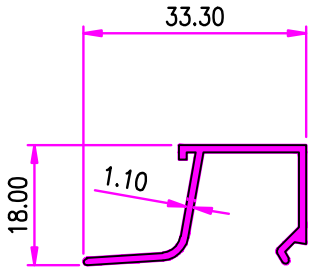
DIE 3326
W : 0.386 KG/M
P : 151.50 MM



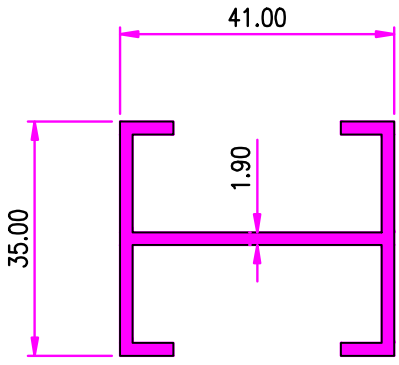
DIE 3318
W : 0.587 KG/M
P : 281.42 MM



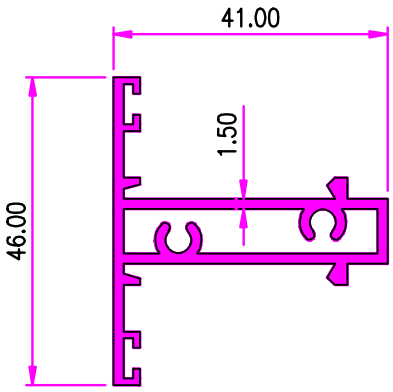
DIE 3319
W : 0.796 KG/M
P : 391.07 MM



DIE 3317
W : 0.209 KG/M
P : 141.49 MM



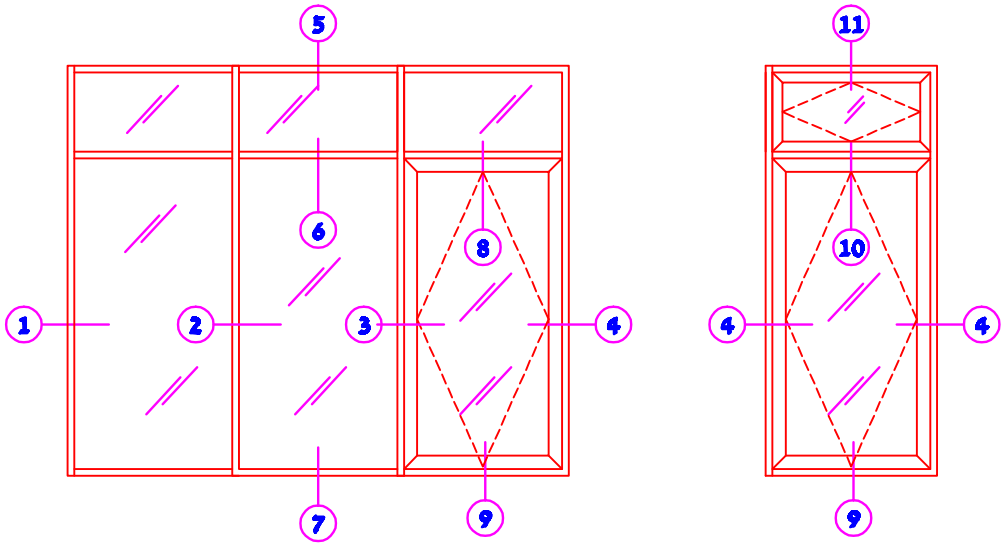
DIE 3320
W : 0.678 KG/M
P : 266.00 MM

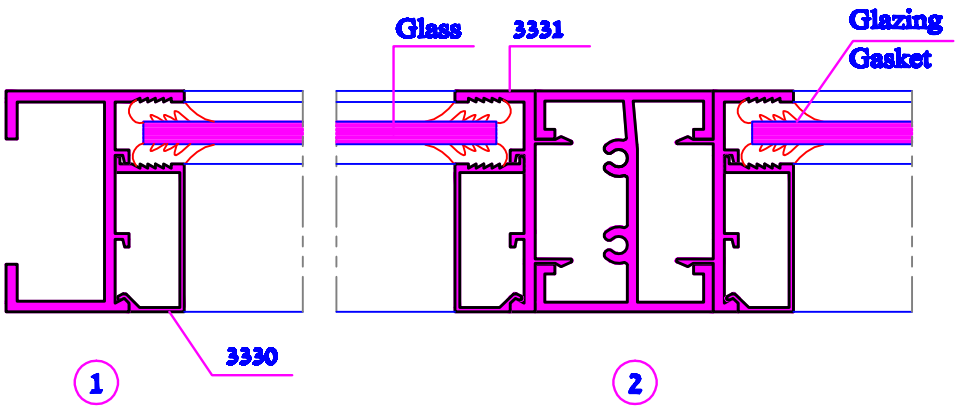


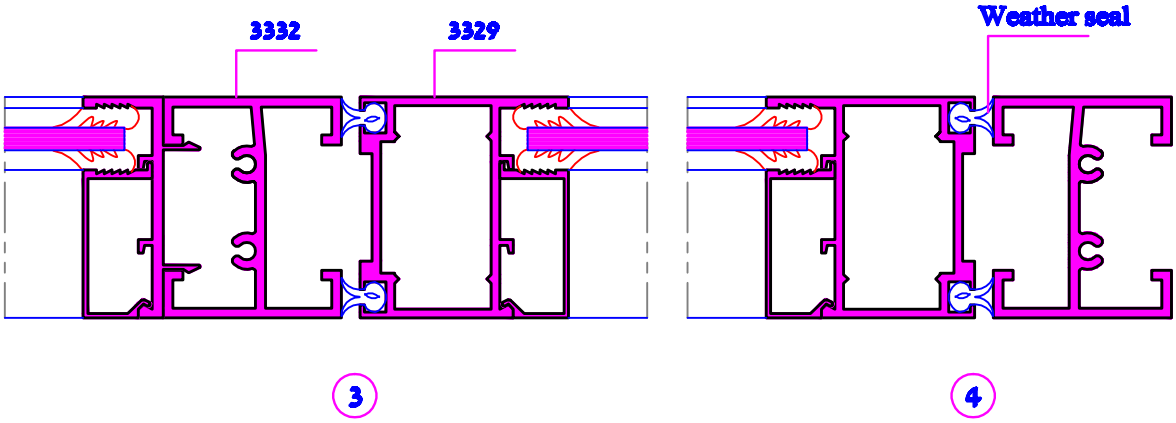
DIE 3325
W : 0.731 KG/M
P : 336.37 MM

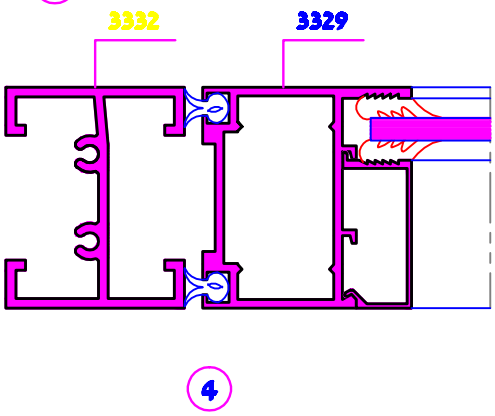
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MEDIUM PIVOT WINDOW ASSEMBLY DETAIL — GROUP : 11C-1





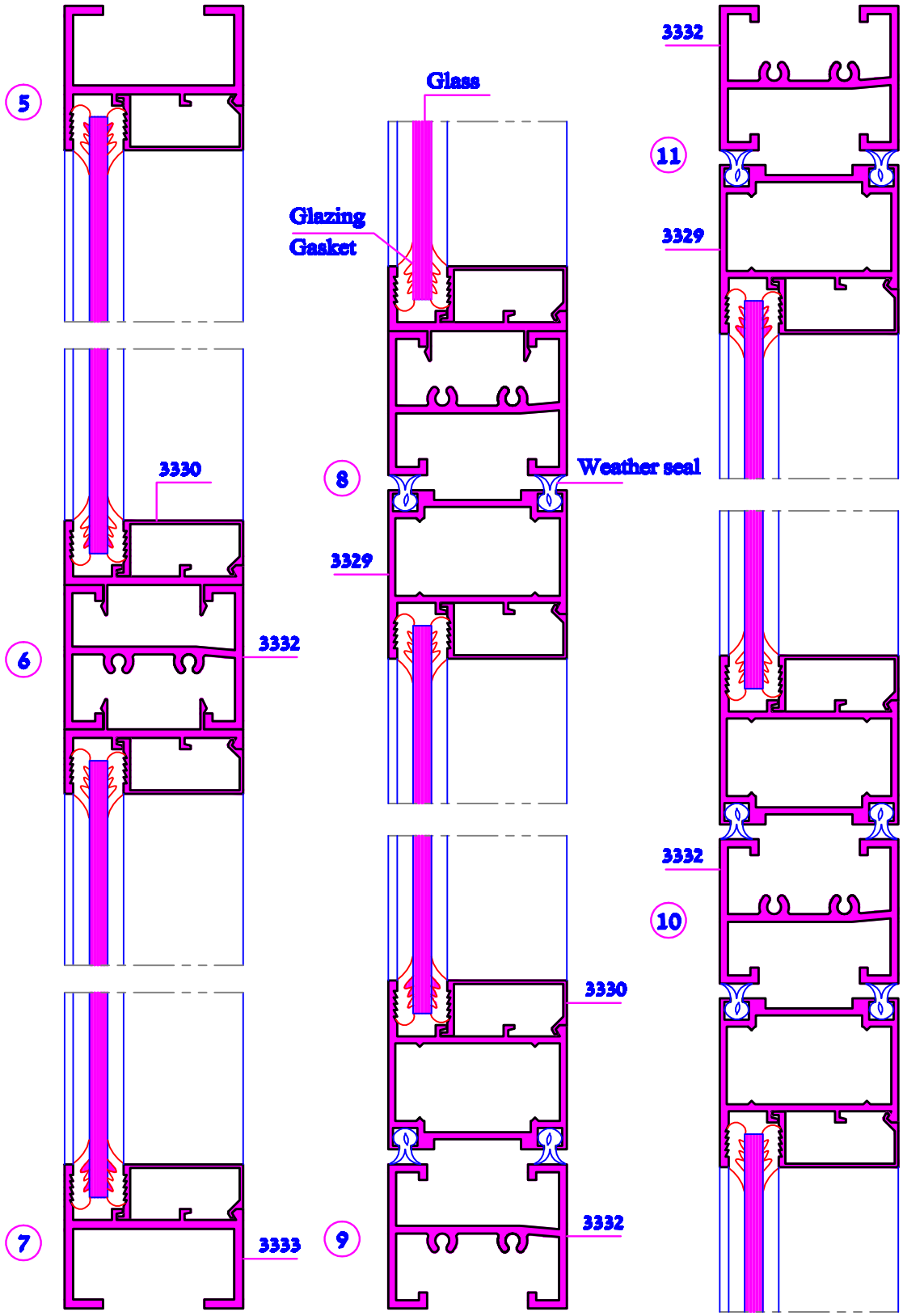




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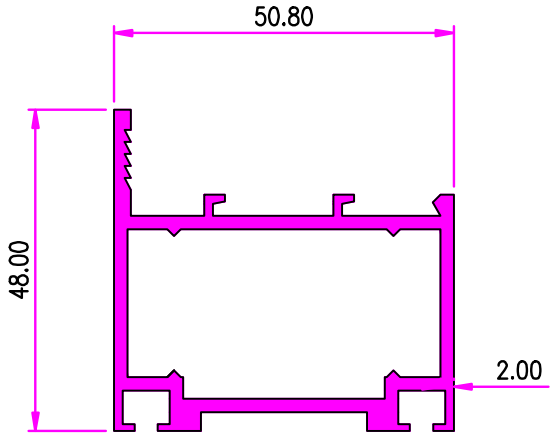
MEDIUM PIVOT WINDOW ASSEMBLY DETAIL

GROUP : 11C-2

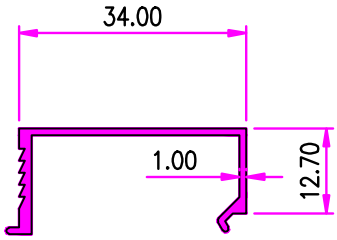


MEDIUM PIVOT WINDOW SECTIONS

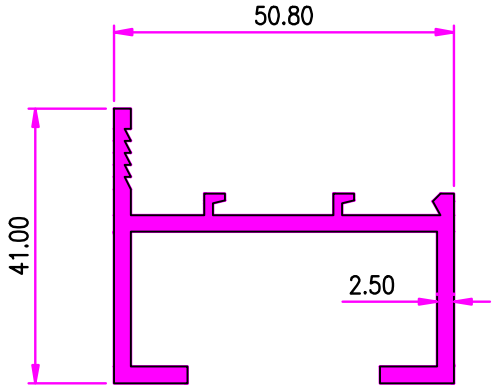
GROUP : 11D-1



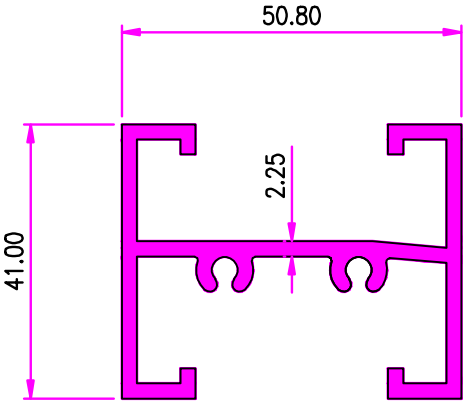
DIE 3329
W : 1.125 KG/M
P : 417.84 MM



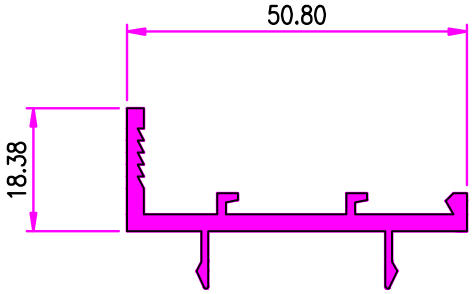
DIE 3330
W : 0.197 KG/M
P : 142.80 MM



DIE 3333
W : 0.940 KG/M
P : 292.00 MM



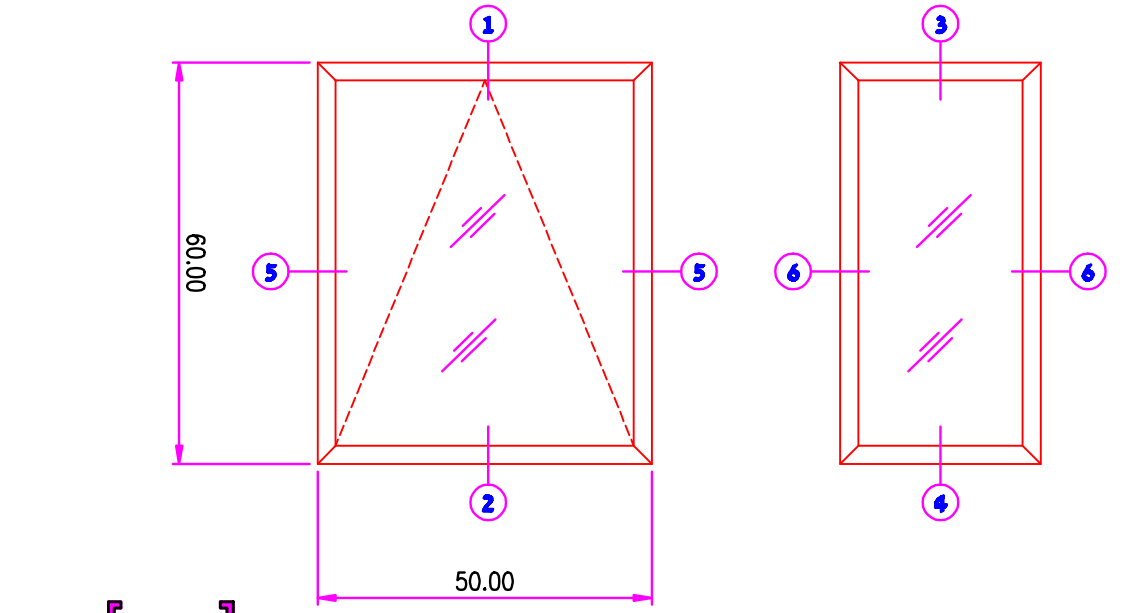
DIE 3332
W : 1.235 KG/M
P : 395.30 MM

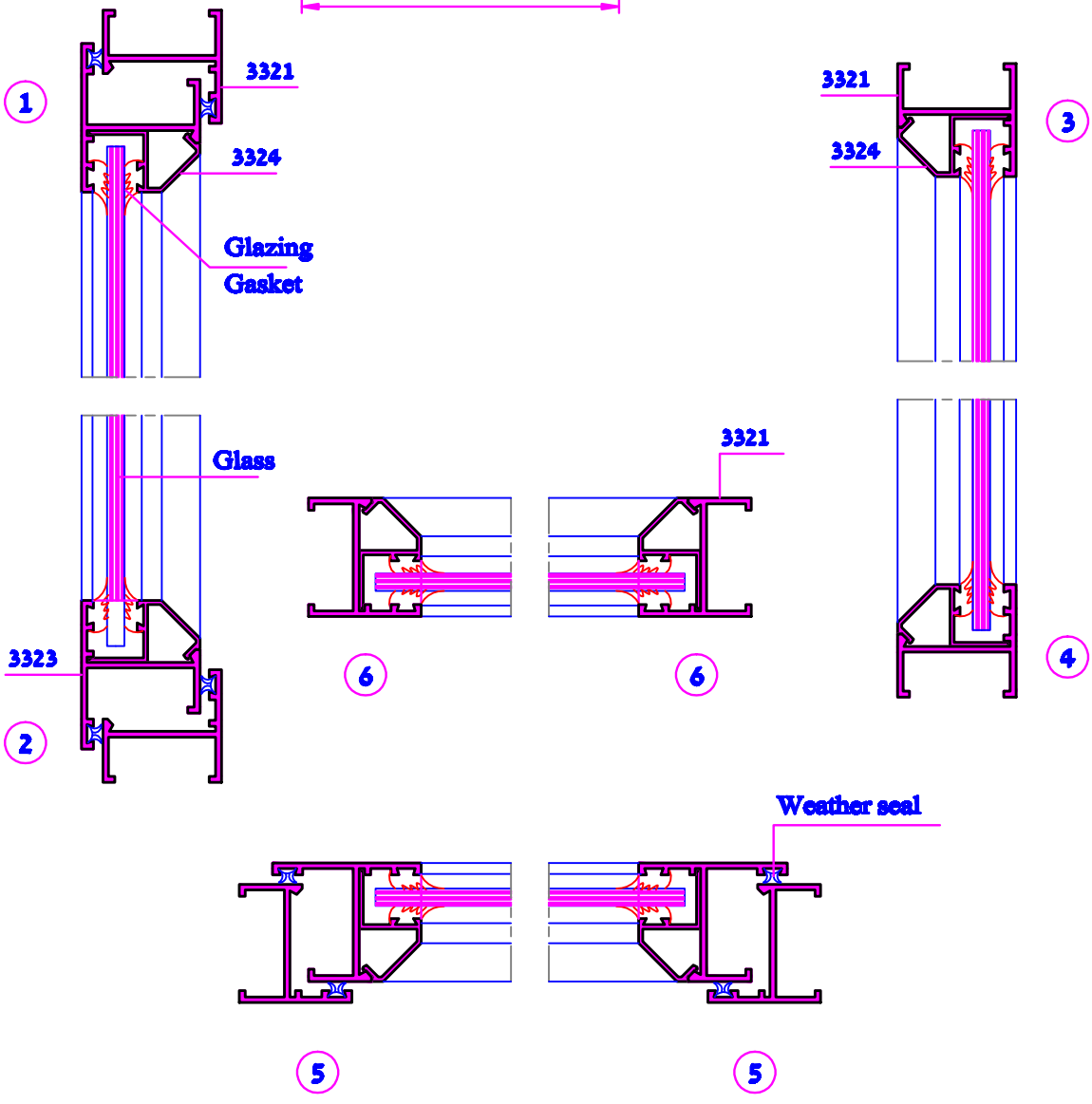


DIE 3331
W : 0.557 KG/M
P : 211.50 MM

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(Aluminium Extrusions Indonesia)

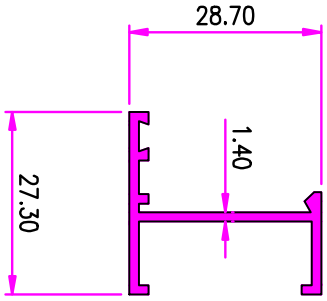
SINGLE ECONOMY CASEMENT WINDOW ASSEMBLY DETAIL GROUP : 11E-1



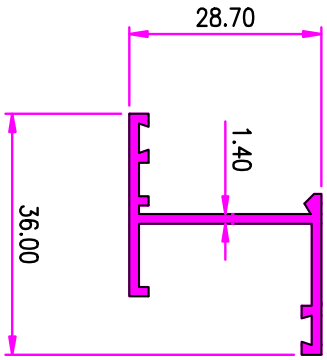


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(Aluminium Extrusions Indonesia)

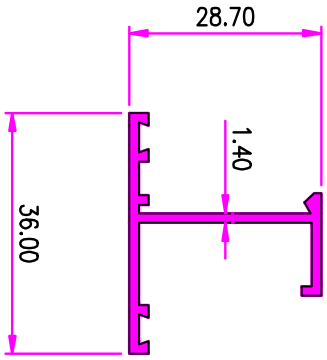
ECONOMY CASEMENT WINDOW SECTIONS — GROUP : 11F-1



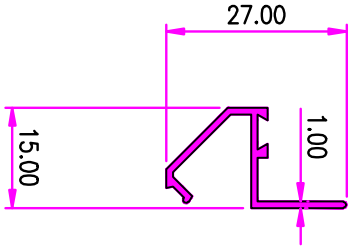
DIE 3321
W : 0.303 KG/M
P : 156.50 MM



DIE 3322
W : 0.342 KG/M
P : 178.00 MM



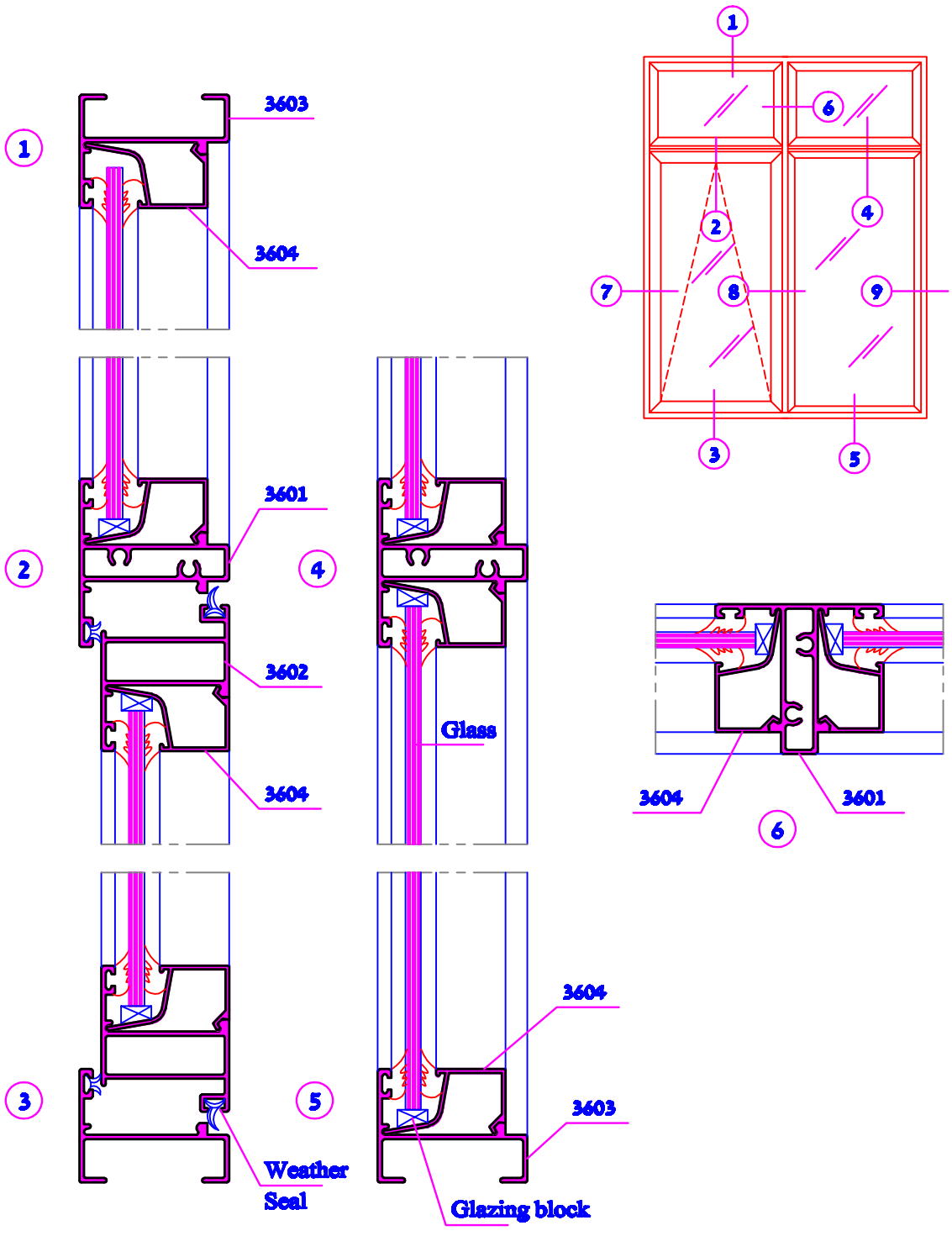
DIE 3323
W : 0.342 KG/M
P : 178.00 MM



DIE 3324
W : 0.163 KG/M
P : 112.50 MM

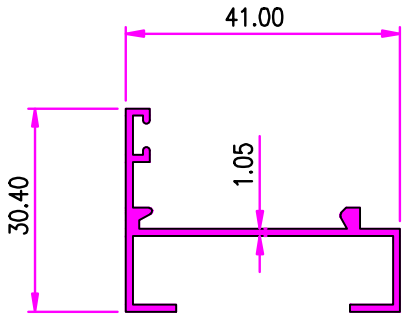
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

CASEMENT WINDOWS ASSEMBLY DETAIL — GROUP : 11G-1

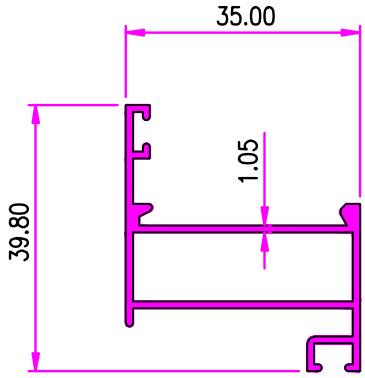


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(Aluminium Extrusions Indonesia)

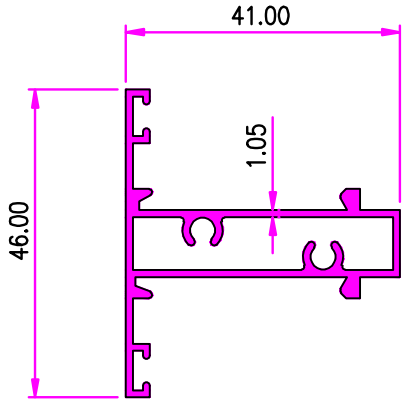
CASEMENT WINDOWS 1.05 MM THICK — GROUP : 11H-1



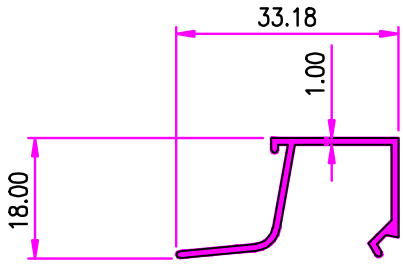
DIE 5090
W : 0.327 KG/M
P : 215.50 MM



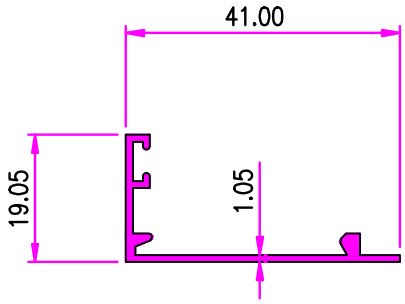
DIE 5091
W : 0.437 KG/M
P : 204.22 MM



DIE 5092
W : 0.560 KG/M
P : 222.40 MM



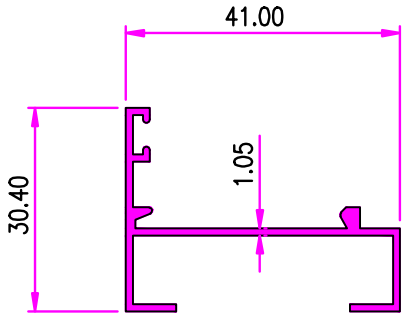
DIE 921
W : 0.187 KG/M
P : 137.60 MM



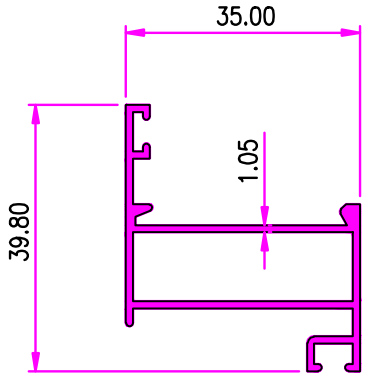
DIE 6733
W : 0.223 KG/M
P : 144.75 MM

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

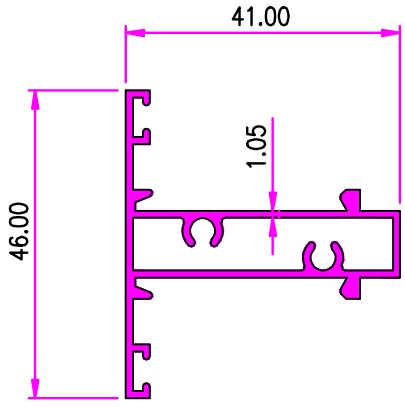
CASEMENT WINDOWS 1.05 MM THICK — GROUP : 11H-2



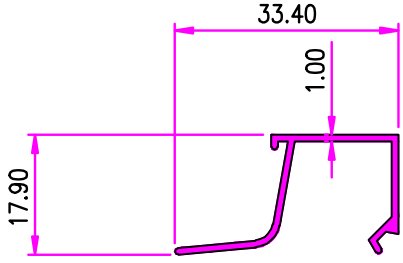
DIE 5090R
W : 0.324 KG/M
P : 216.64 MM



DIE 5091R
W : 0.435 KG/M
P : 205.16 MM



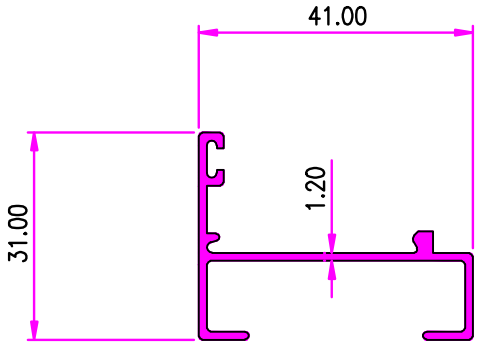
DIE 5092R
W : 0.554 KG/M
P : 224.69 MM



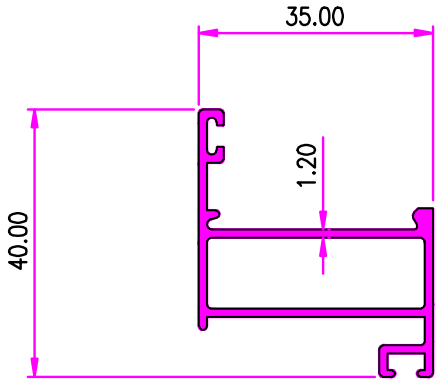
DIE 921R
W : 0.189 KG/M
P : 138.14 MM

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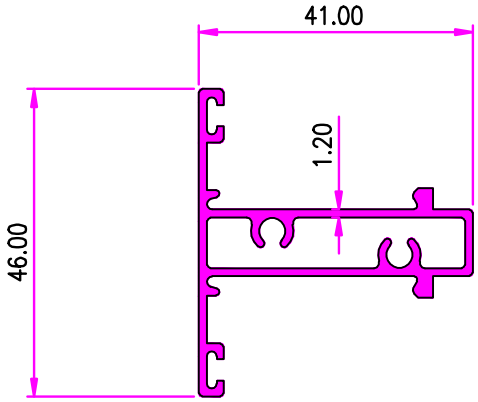
CASEMENT WINDOWS 1.20 MM THICK — GROUP : 11I-1



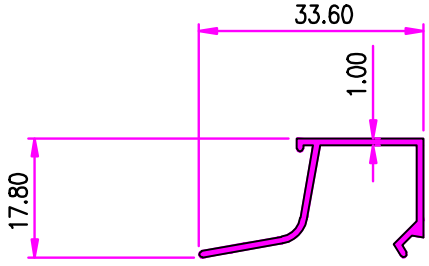
DIE 3603
W : 0.360 KG/M
P : 211.97 MM



DIE 3602
W : 0.482 KG/M
P : 198.87 MM



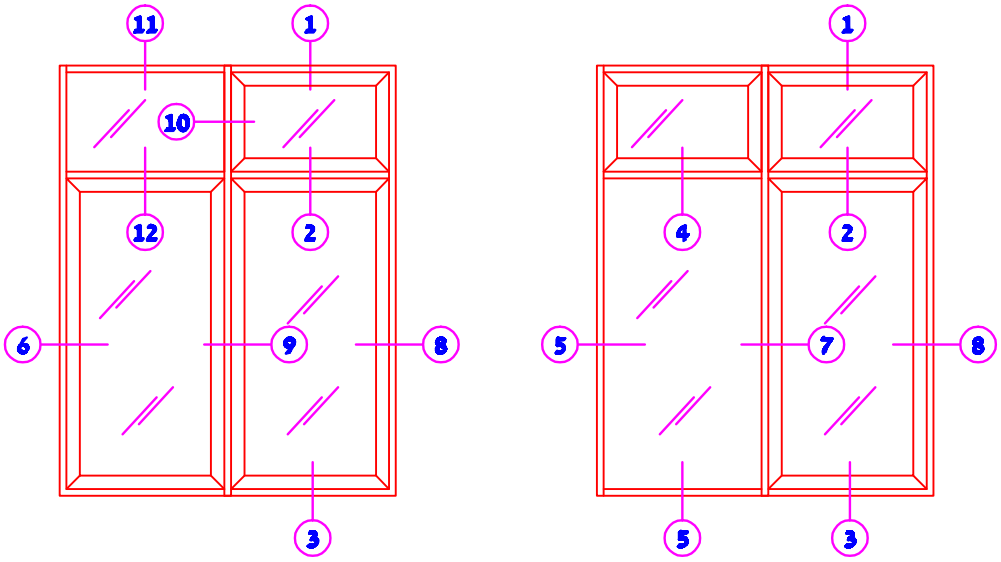
DIE 3601
W : 0.604 KG/M
P : 216.98 MM

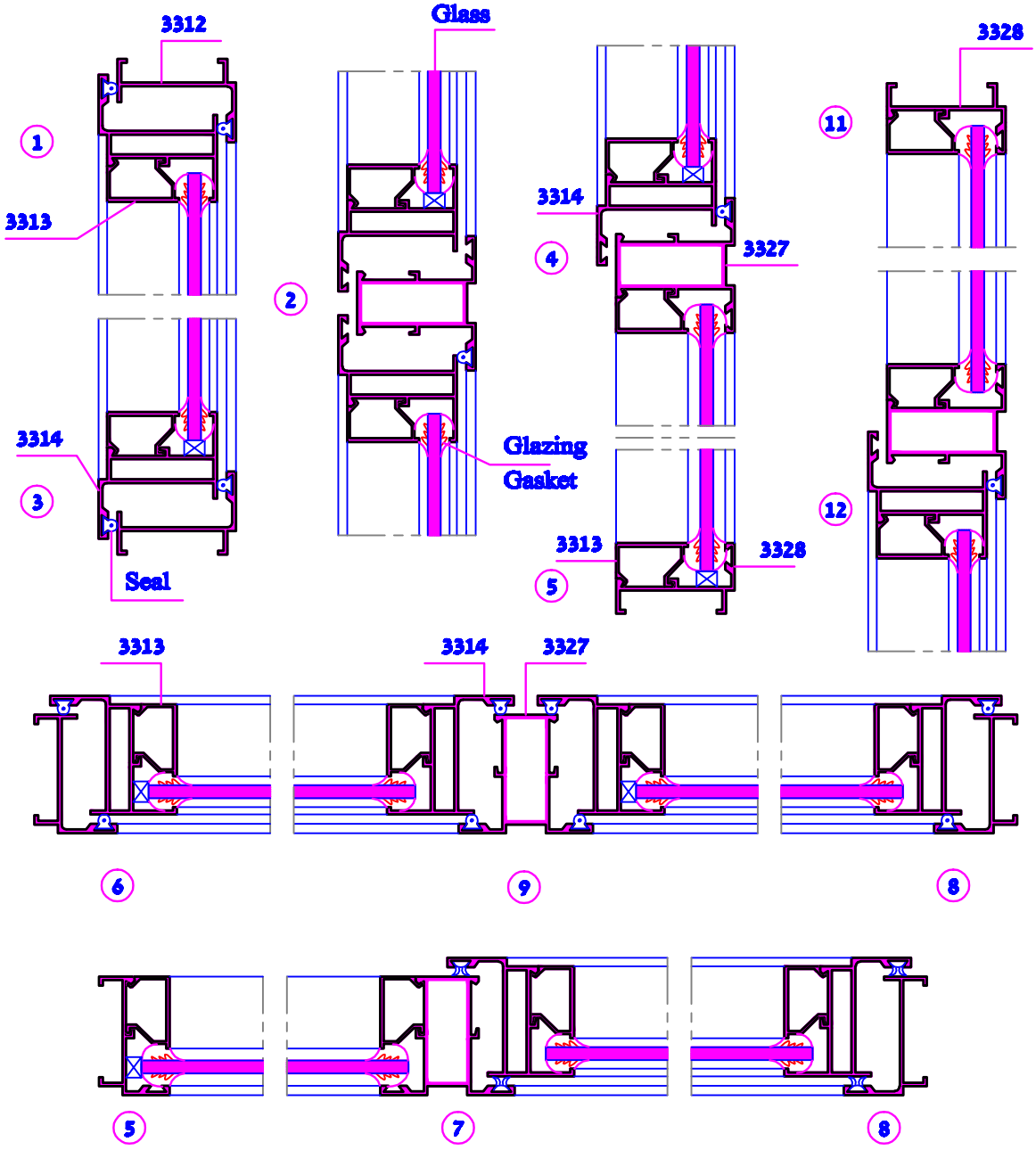


DIE 3604
W : 0.186 KG/M
P : 136.31 MM

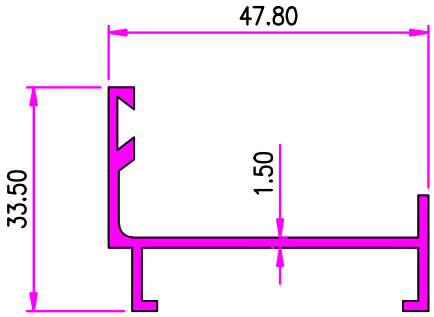
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

DOUBLE CASEMENT WINDOW ASSEMBLY DETAIL — GROUP : 11J-1

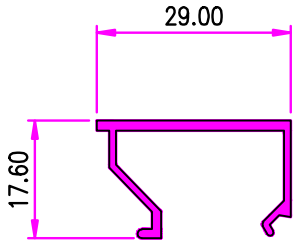




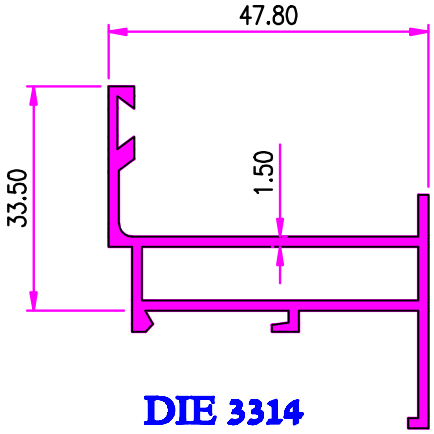
MEDIUM CASEMENT WINDOW SECTIONS — GROUP : 11K-1



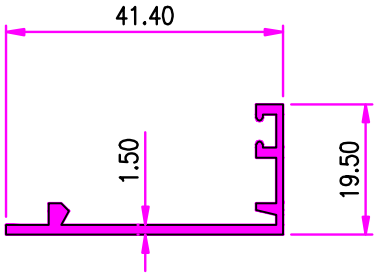
DIE 3312
W : 0.445 KG/M
P : 217.90 MM



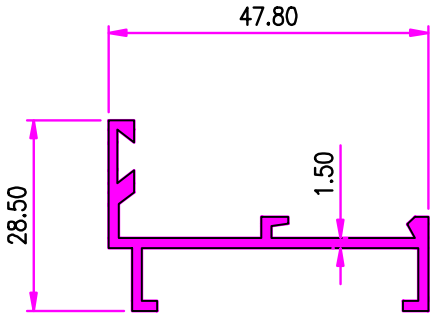
DIE 3313
W : 0.255 KG/M
P : 143.34 MM



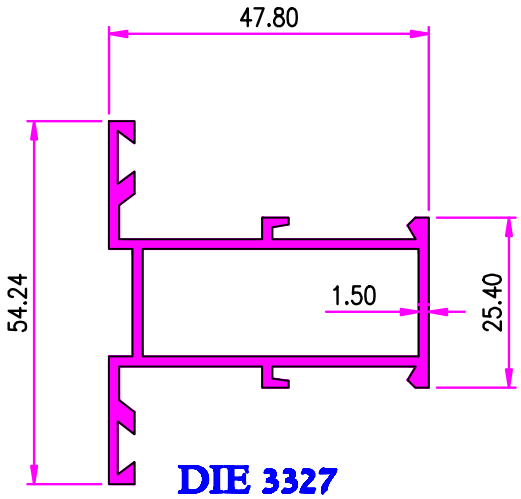
DIE 3314
W : 0.713 KG/M
P : 346.24 MM



DIE 3315
W : 0.295 KG/M
P : 147.34 MM



DIE 3328
W : 0.440 KG/M
P : 213.00 MM

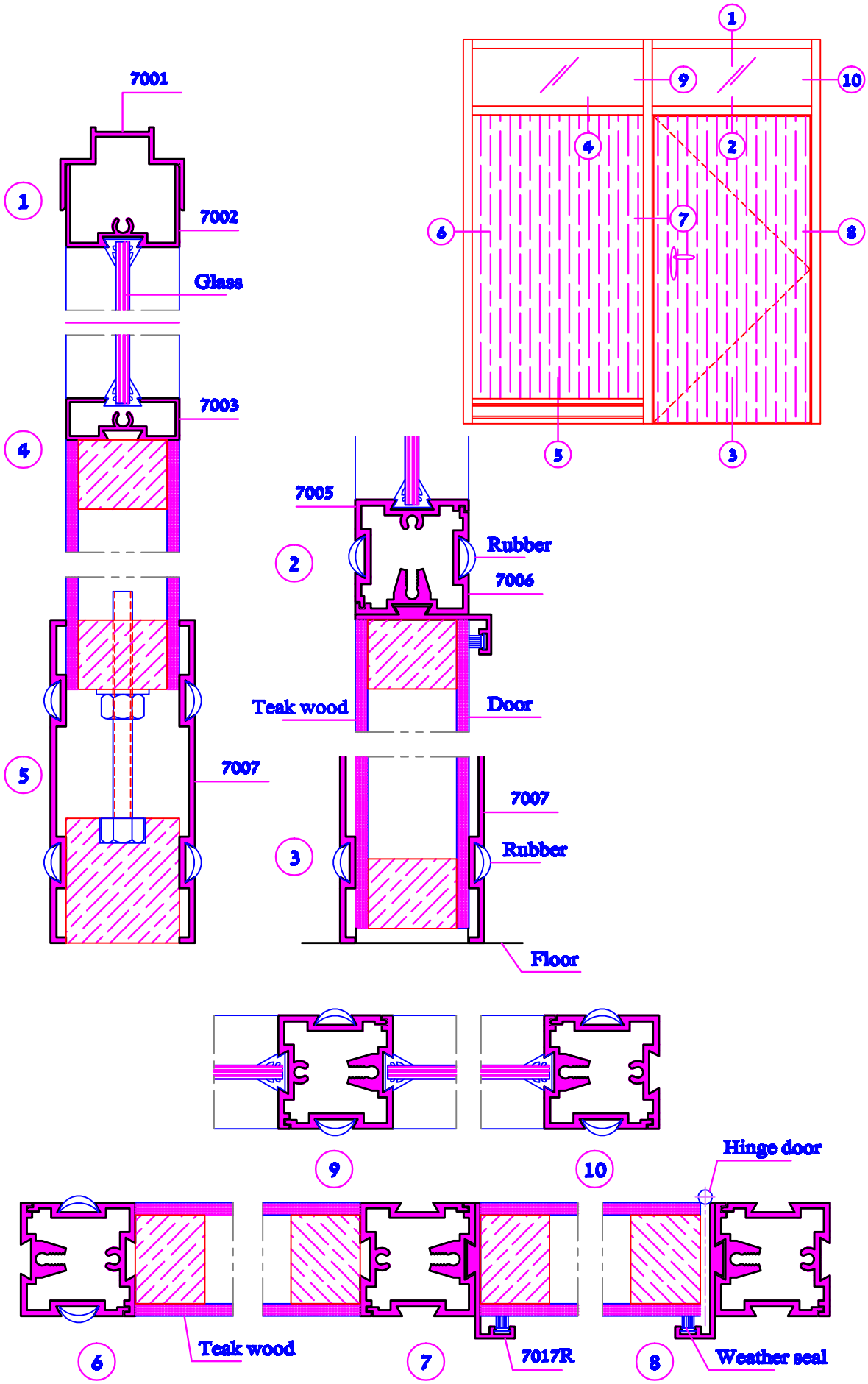


DIE 3327
W : 0.794 KG/M
P : 386.50 MM

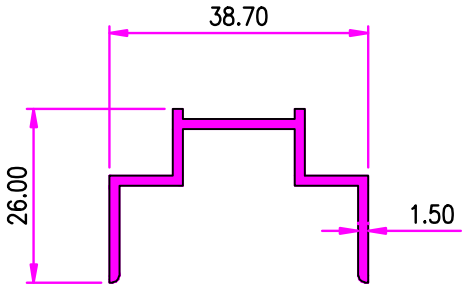
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PARTITION ASSEMBLY DETAIL

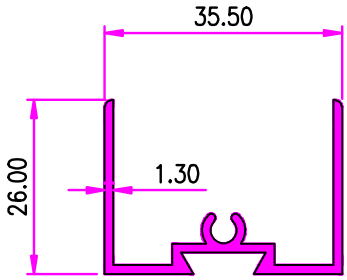
GROUP : 12A-1



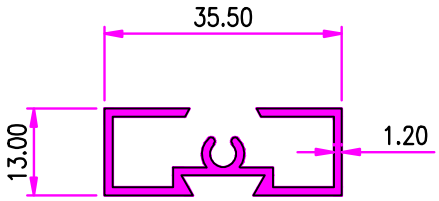
PARTITION SECTIONS **GROUP : 12B-1**



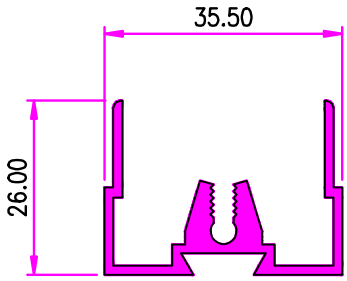
DIE 7001
W : 0.380 KG/M
P : 171.80 MM



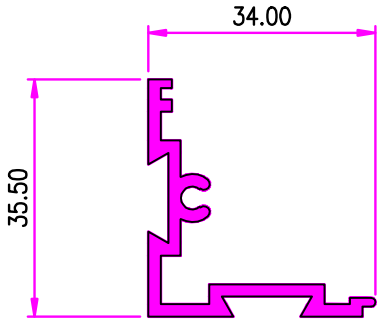
DIE 7002
W : 0.370 KG/M
P : 191.60 MM



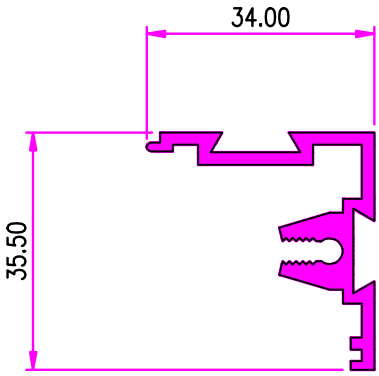
DIE 7003
W : 0.330 KG/M
P : 190.00 MM



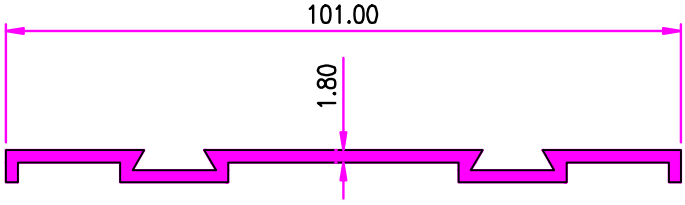
DIE 7004
W : 0.520 KG/M
P : 257.60 MM



DIE 7005
W : 0.520 KG/M
P : 196.00 MM

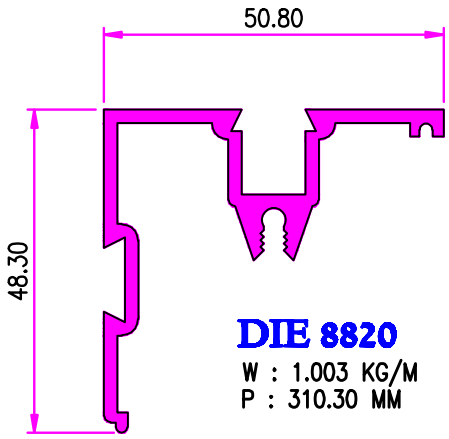


DIE 7006
W : 0.540 KG/M
P : 222.00 MM



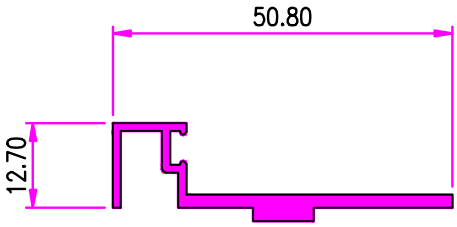
DIE 7007
W : 0.640 KG/M
P : 251.00 MM

PARTITION SECTIONS **GROUP : 12B-2**



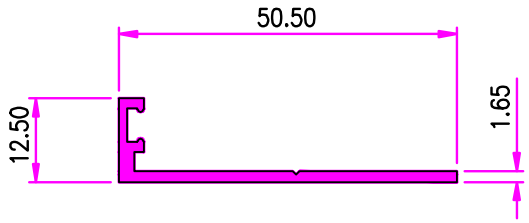
DIE 8820

W : 1.003 KG/M
P : 310.30 MM



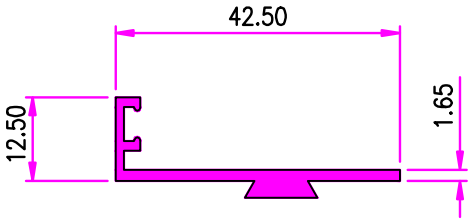
DIE 8821

W : 0.412 KG/M
P : 172.24 MM



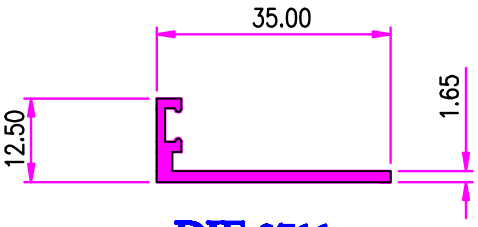
DIE 7017

W : 0.301 KG/M
P : 113.40 MM



DIE 7017R

W : 0.313 KG/M
P : 130.04 MM

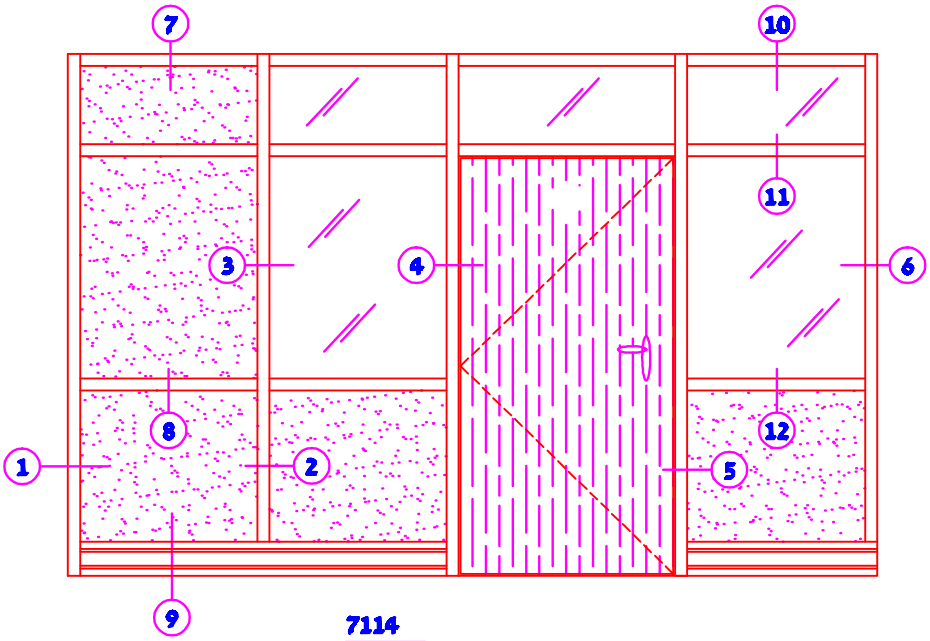


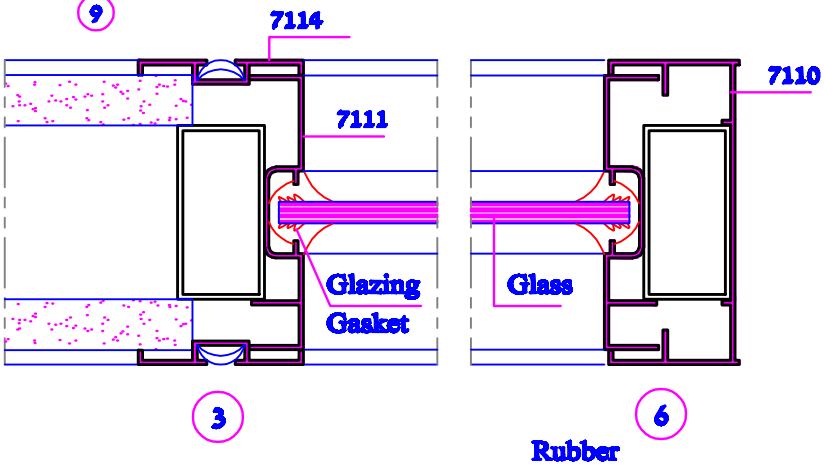
DIE 8711

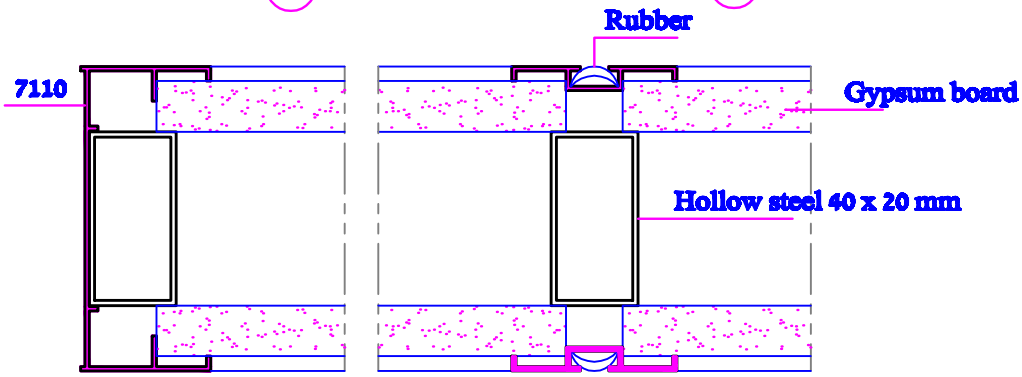
W : 0.233 KG/M
P : 102.40 MM

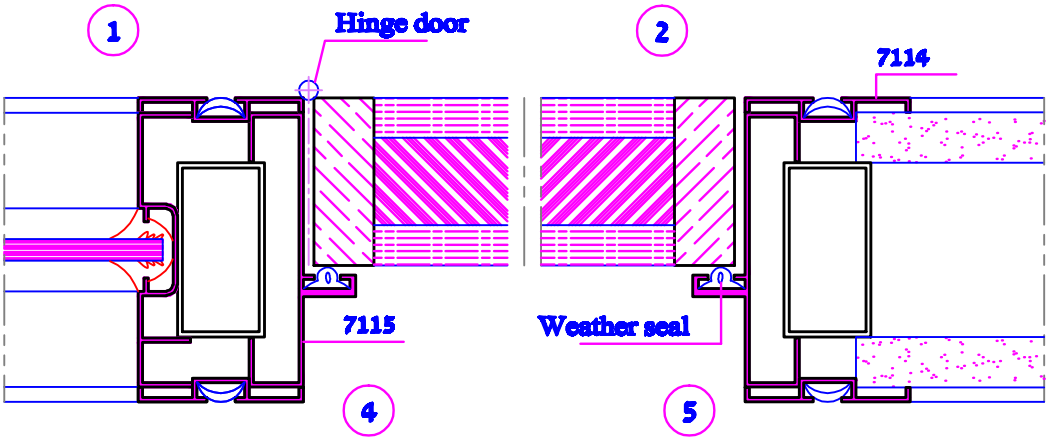
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

GYPSUM PARTITION ASSEMBLY DETAIL — GROUP : 12C-1





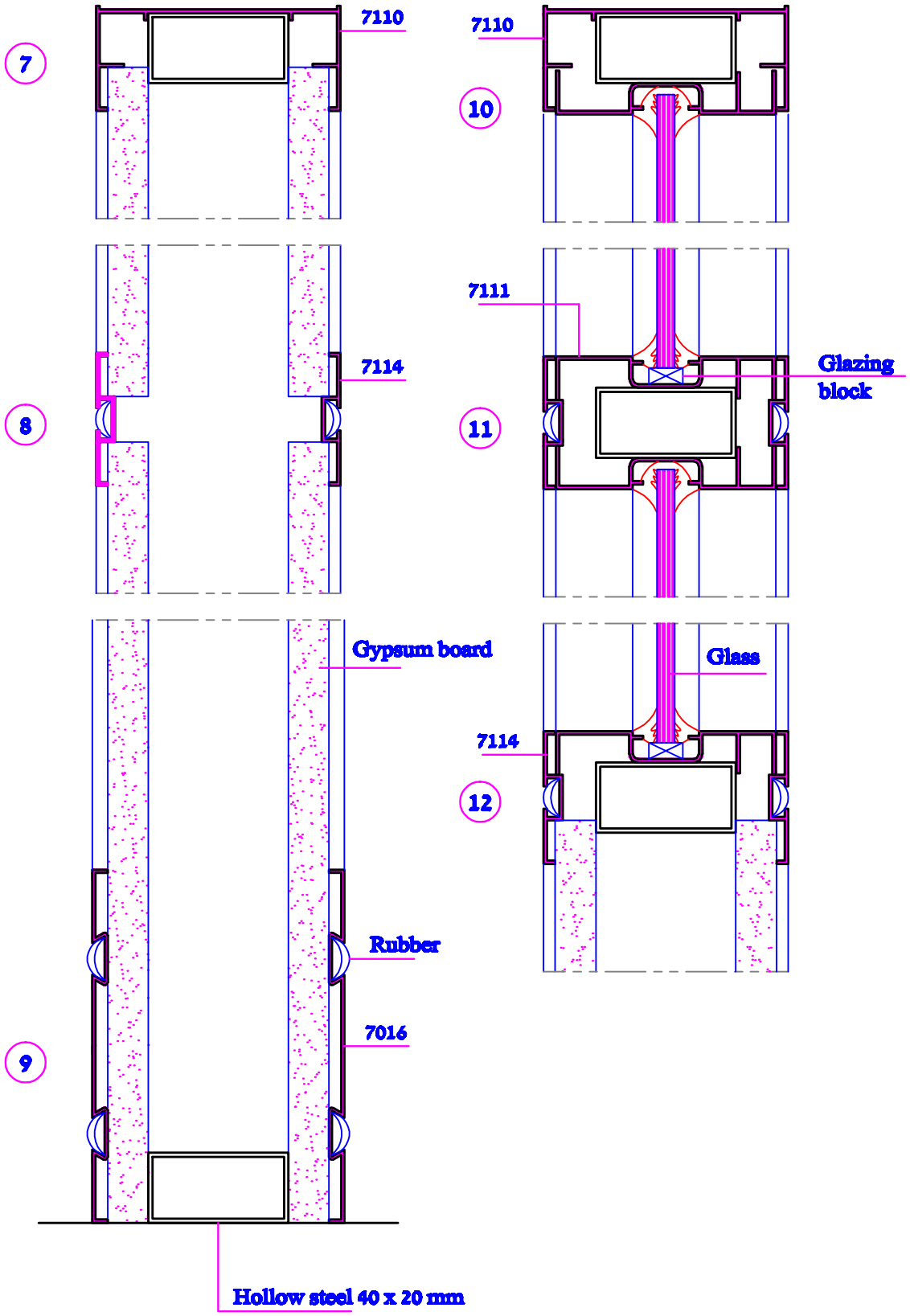




PT.ALEXINDO
(Aluminium Extrusions Indonesia)

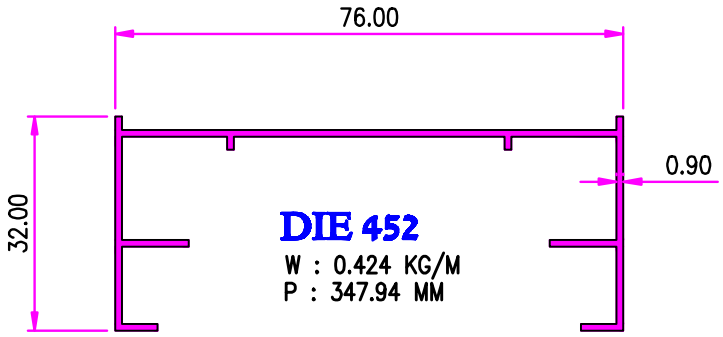
GYPSUM PARTITION ASSEMBLY DETAIL

GROUP : 12C-2

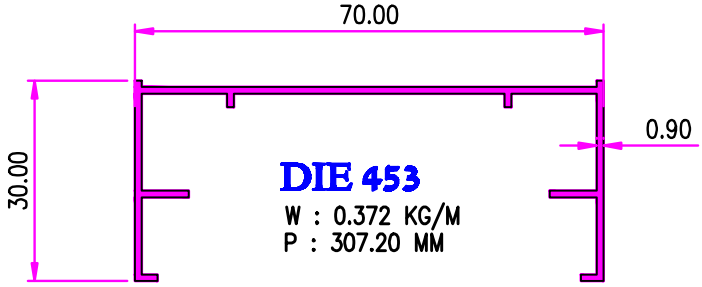


PT.ALEXINDO
(Aluminium Extrusions Indonesia)

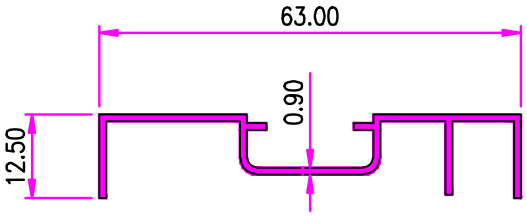
GYPSUM PARTITION 0.90 MM THICK — GROUP : 12D-1



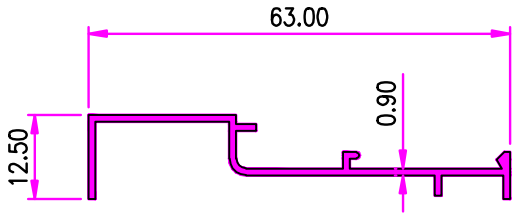
DIE 452
W : 0.424 KG/M
P : 347.94 MM



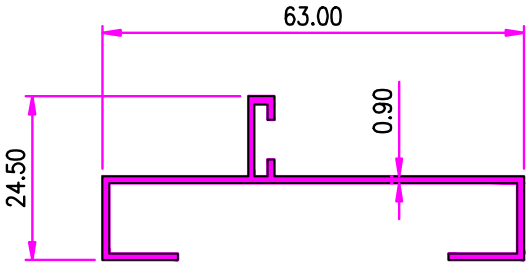
DIE 453
W : 0.372 KG/M
P : 307.20 MM



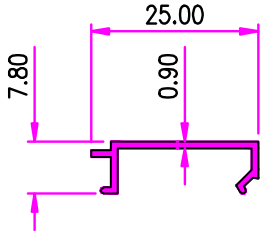
DIE 454
W : 0.287 KG/M
P : 237.28 MM



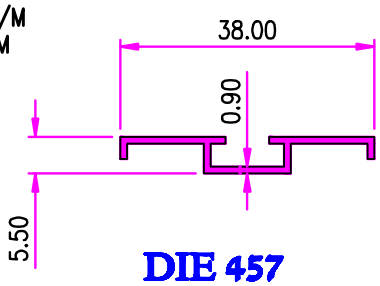
DIE 455
W : 0.244 KG/M
P : 196.98 MM



DIE 458
W : 0.310 KG/M
P : 255.80 MM



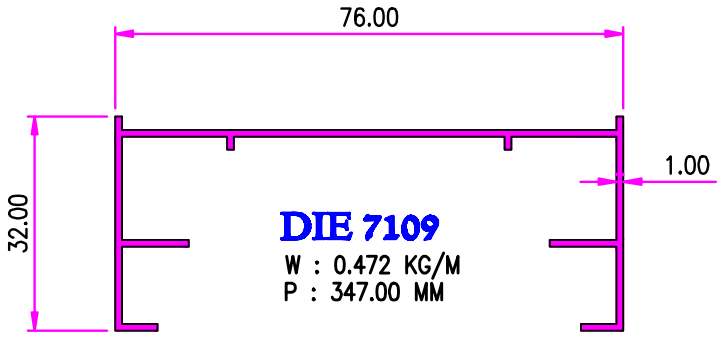
DIE 456
W : 0.103 KG/M
P : 85.38 MM



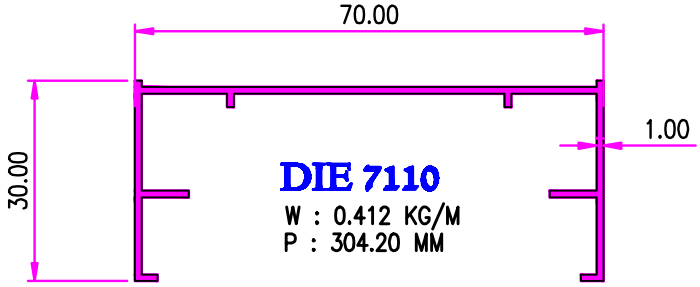
DIE 457
W : 0.150 KG/M
P : 114.00 MM

GYPSUM PARTITION 1.00 MM THICK

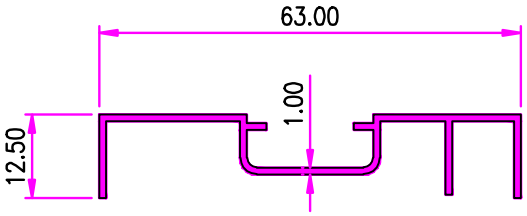
GROUP : 12E-1



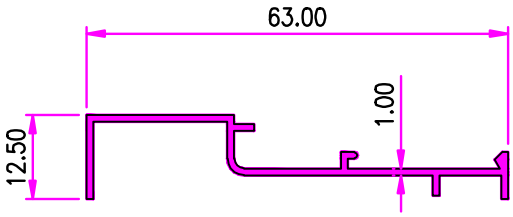
DIE 7109
W : 0.472 KG/M
P : 347.00 MM



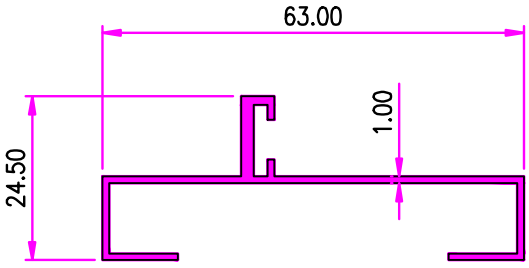
DIE 7110
W : 0.412 KG/M
P : 304.20 MM



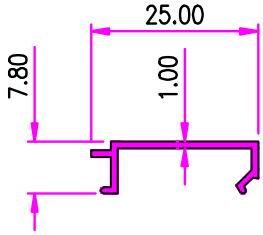
DIE 7111
W : 0.309 KG/M
P : 230.00 MM



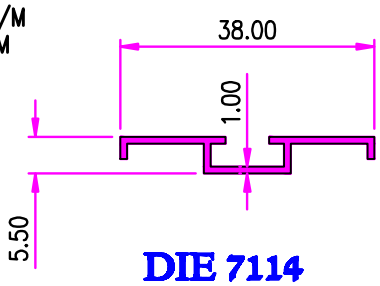
DIE 7112
W : 0.263 KG/M
P : 190.41 MM



DIE 7115
W : 0.373 KG/M
P : 253.57 MM



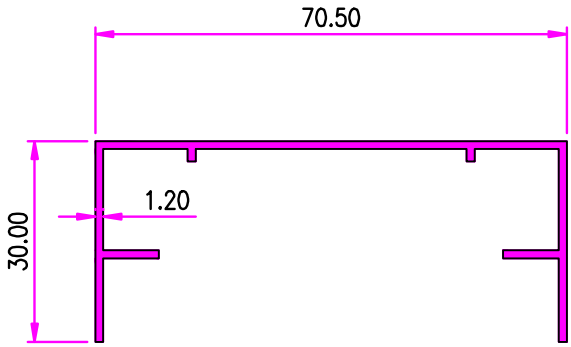
DIE 7113
W : 0.110 KG/M
P : 83.20 MM



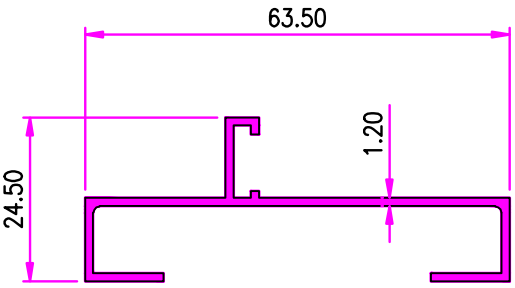
DIE 7114
W : 0.150 KG/M
P : 112.54 MM

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(Aluminium Extrusions Indonesia)

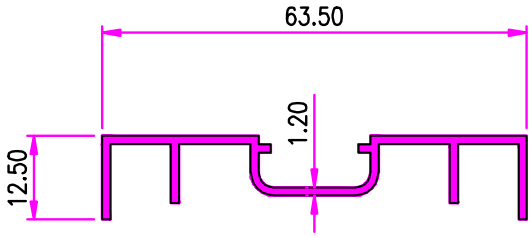
GYPSUM PARTITION 1.20 MM THICK — GROUP : 12F-1



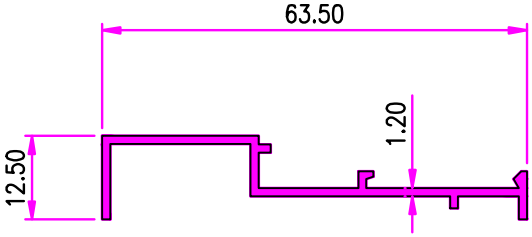
DIE 7008
W : 0.500 KG/M
P : 313.00 MM



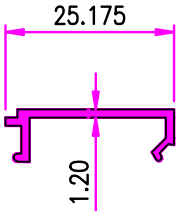
DIE 7012
W : 0.412 KG/M
P : 255.00 MM



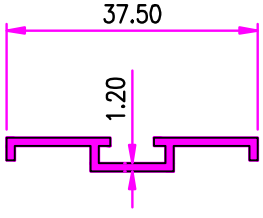
DIE 7009
W : 0.375 KG/M
P : 221.00 MM



DIE 7011
W : 0.325 KG/M
P : 195.55 MM



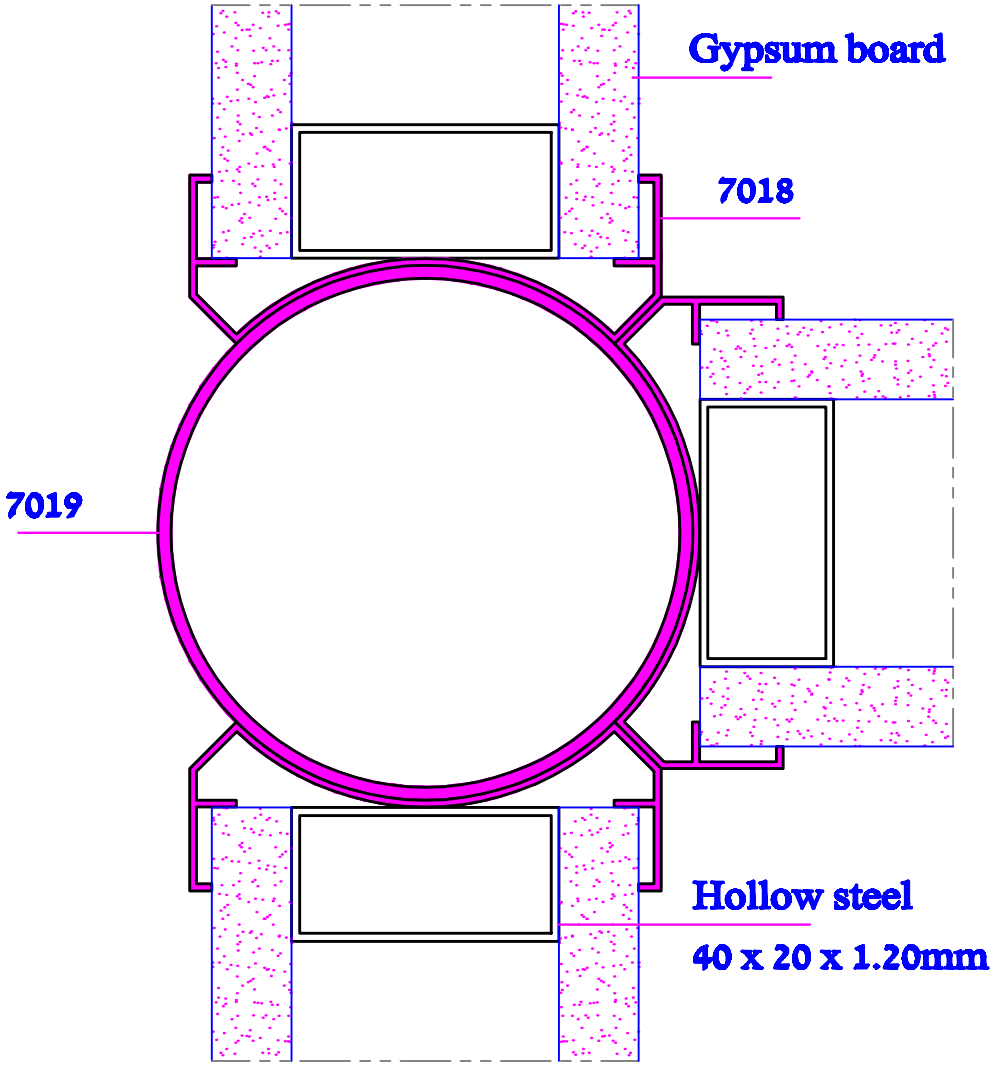
DIE 7010
W : 0.137 KG/M
P : 87.50 MM



DIE 7013
W : 0.172 KG/M
P : 108.80 MM

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

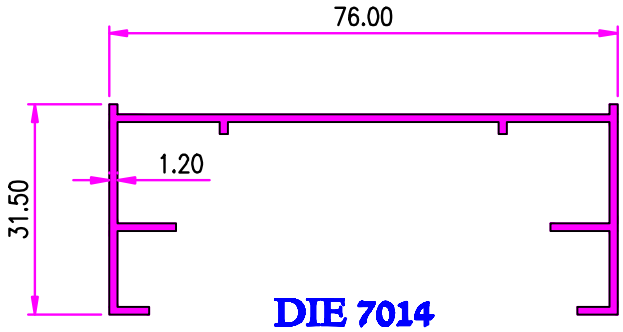
GYPSUM PARTITION THREE WAY JUNCTION ASSEMBLY GROUP : 12G-1



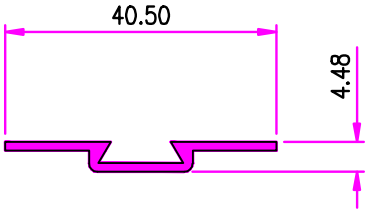
Corner Assembly detail
(Partition Double Gypsum)

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(Aluminium Extrusions Indonesia)

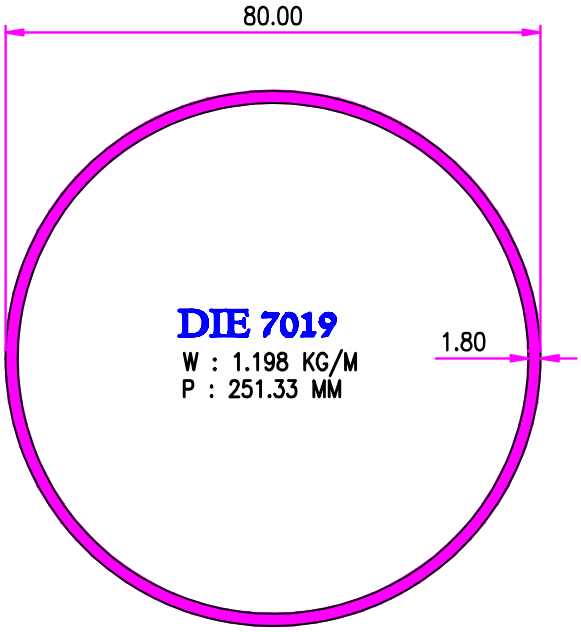
GYPSUM PARTITION SECTIONS — GROUP : 12H-1



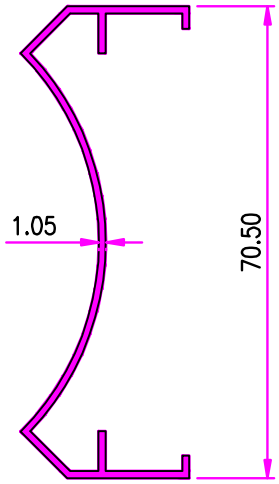
DIE 7014
W : 0.549 KG/M
P : 321.20 MM



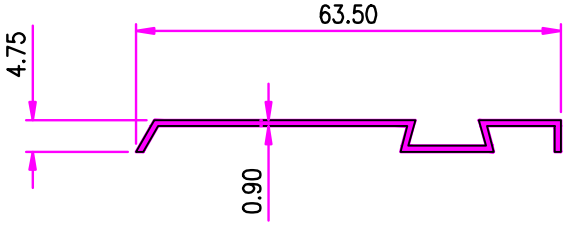
DIE 8692
W : 0.180 KG/M
P : 99.83 MM



DIE 7019
W : 1.198 KG/M
P : 251.33 MM

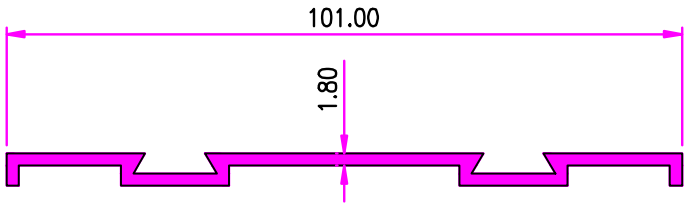


DIE 7018
W : 0.385 KG/M
P : 272.63 MM



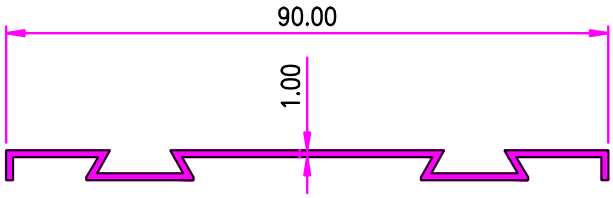
DIE 7033
W : 0.196 KG/M
P : 162.90 MM

OTHERS **GROUP : 12I-1**



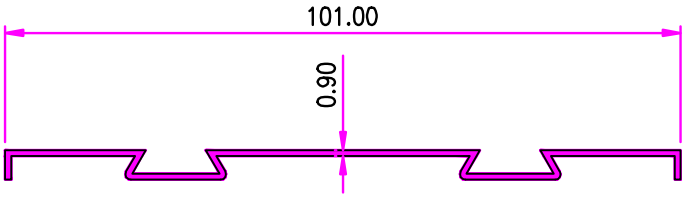
DIE 7007

W : 0.640 KG/M
P : 251.00 MM



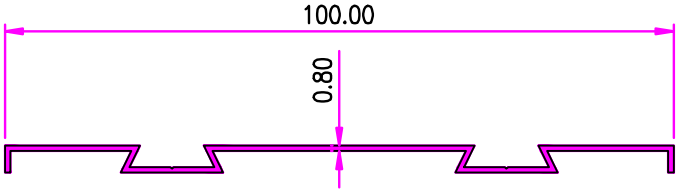
DIE 7015

W : 0.312 KG/M
P : 233.50 MM



DIE 7016

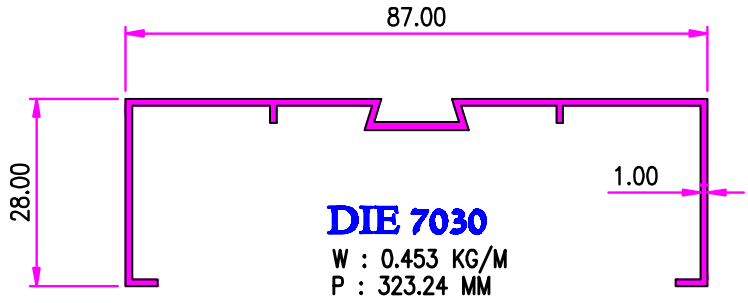
W : 0.341 KG/M
P : 255.50 MM



DIE 7181

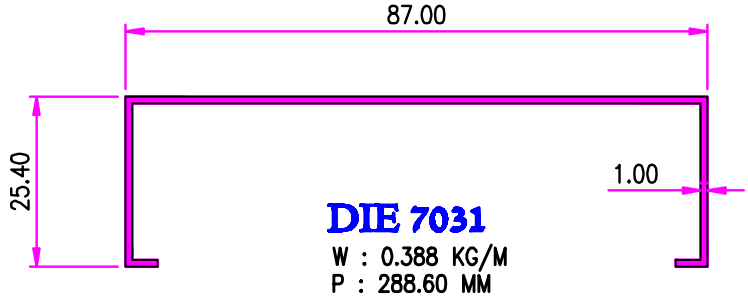
W : 0.277 KG/M
P : 252.86 MM

OTHERS **GROUP : 12I-2**



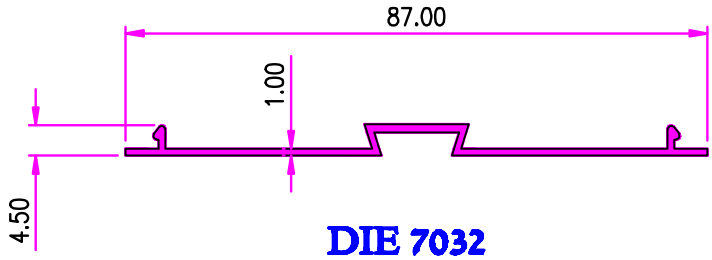
DIE 7030

W : 0.453 KG/M
P : 323.24 MM



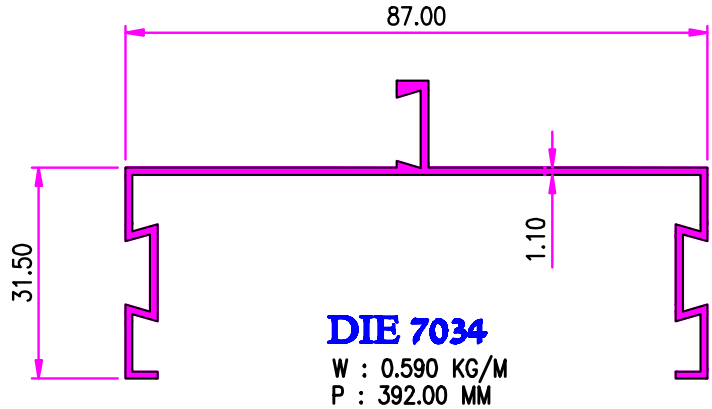
DIE 7031

W : 0.388 KG/M
P : 288.60 MM



DIE 7032

W : 0.304 KG/M
P : 210.50 MM



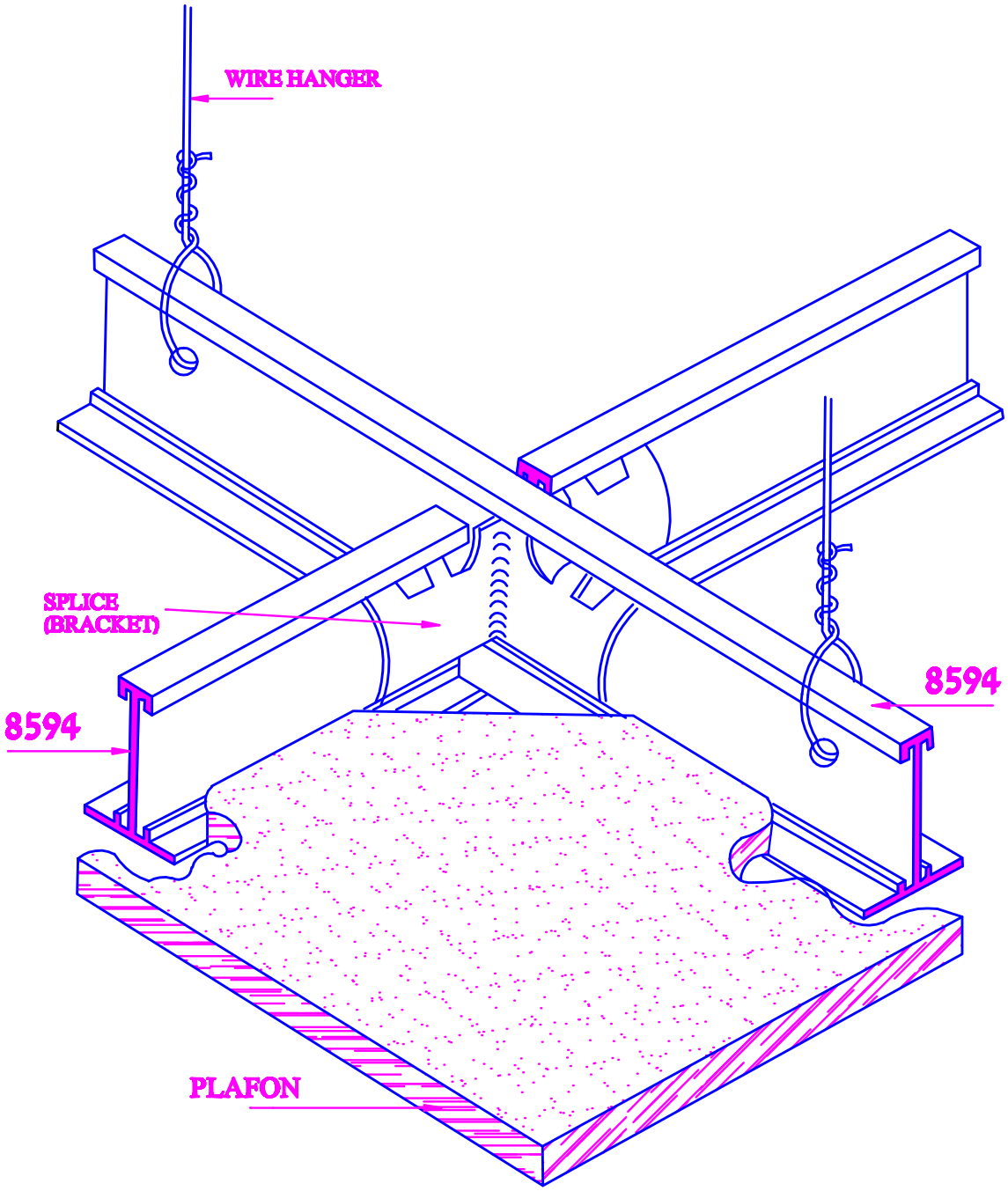
DIE 7034

W : 0.590 KG/M
P : 392.00 MM

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

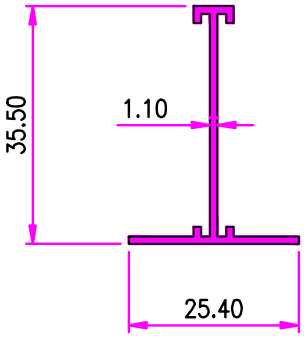
CEILING PERSPECTIVE ASSEMBLY DETAIL

GROUP : 13A-1



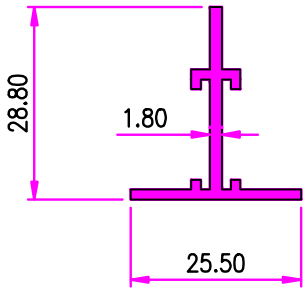
CEILING SECTIONS

GROUP : 13B-1



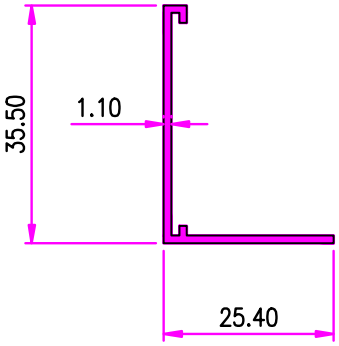
DIE 8594

W : 0.209 KG/M
P : 143.00 MM



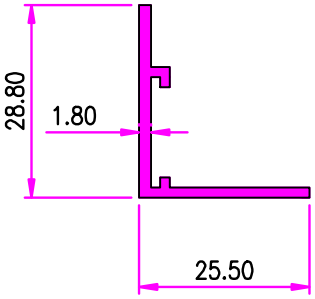
DIE 8582

W : 0.290 KG/M
P : 127.00 MM



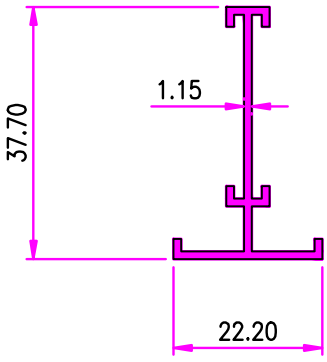
DIE 8595

W : 0.193 KG/M
P : 132.00 MM



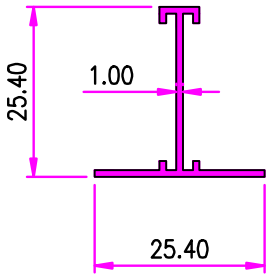
DIE 8584

W : 0.280 KG/M
P : 130.00 MM



DIE 8702

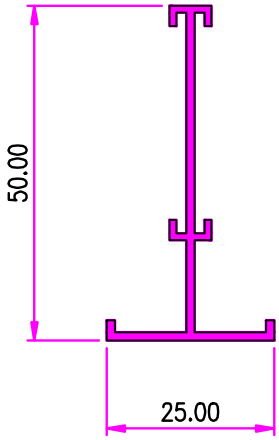
W : 0.260 KG/M
P : 164.50 MM



DIE 8739

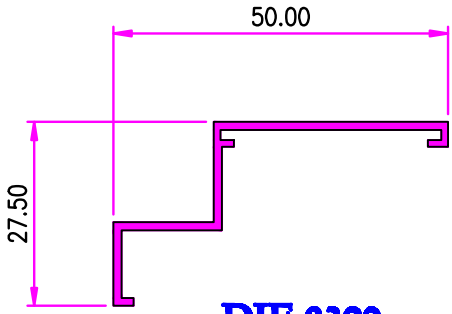
W : 0.164 KG/M
P : 120.80 MM

CEILING SECTIONS **GROUP : 13B-2**



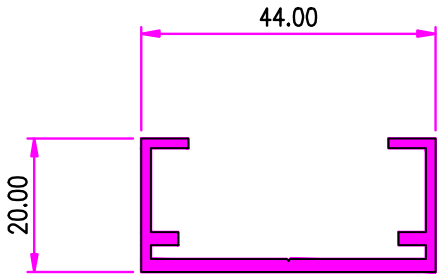
DIE 8391

W : 0.301 KG/M
P : 192.40 MM



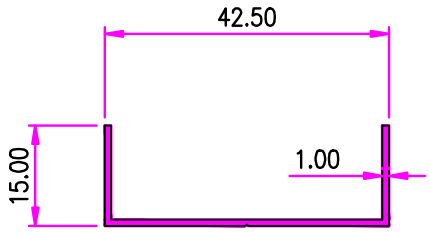
DIE 8390

W : 0.271 KG/M
P : 175.00 MM



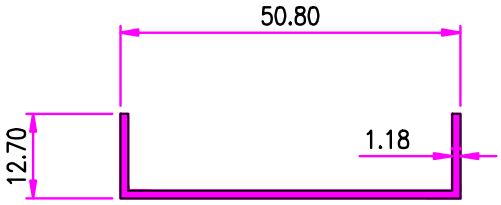
DIE 8358

W : 0.461 KG/M
P : 203.50 MM



DIE 8357

W : 0.182 KG/M
P : 143.50 MM

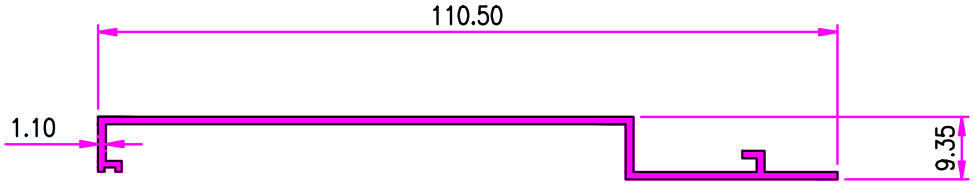


DIE 1081

W : 0.236 KG/M
P : 150.00 MM

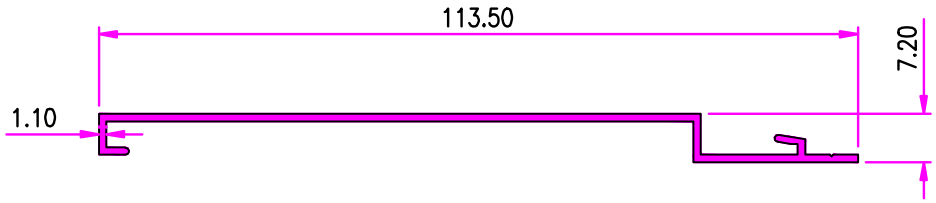
SPANDREL SECTIONS

GROUP : 13C-1



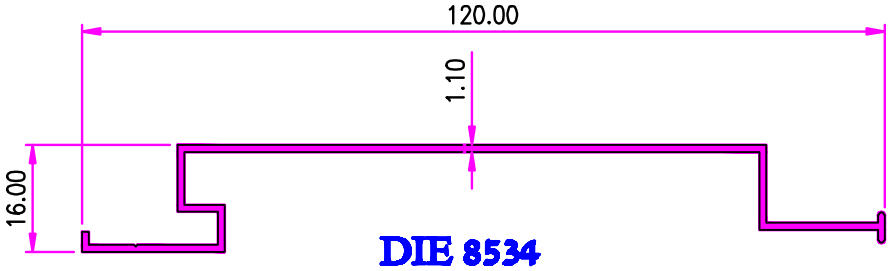
DIE 8831

W : 0.402 KG/M
P : 274.80 MM



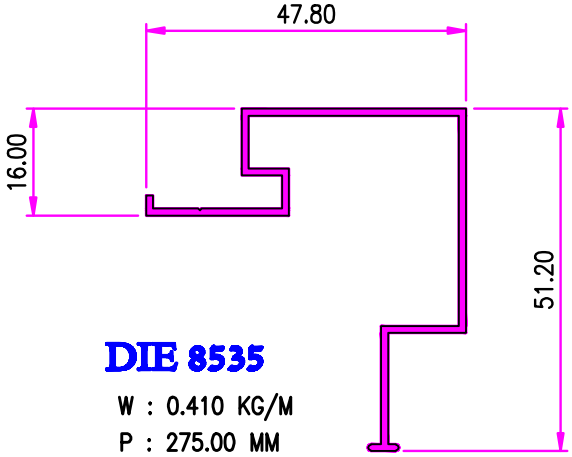
DIE 8637

W : 0.402 KG/M
P : 271.70 MM



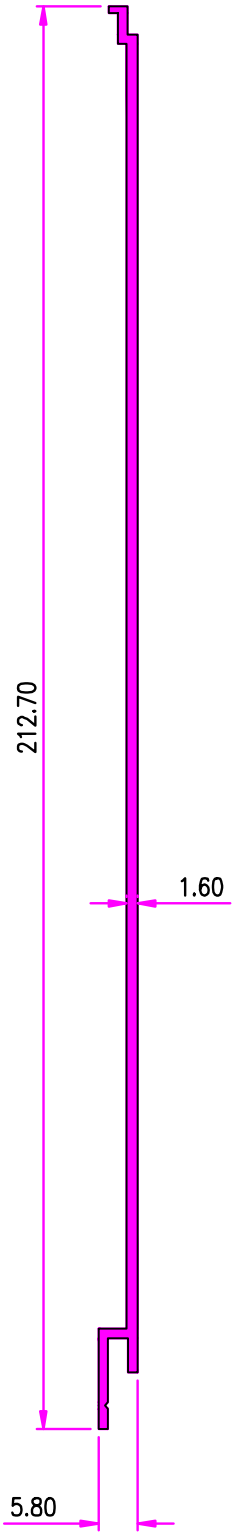
DIE 8534

W : 0.473 KG/M
P : 321.00 MM



DIE 8535

W : 0.410 KG/M
P : 275.00 MM

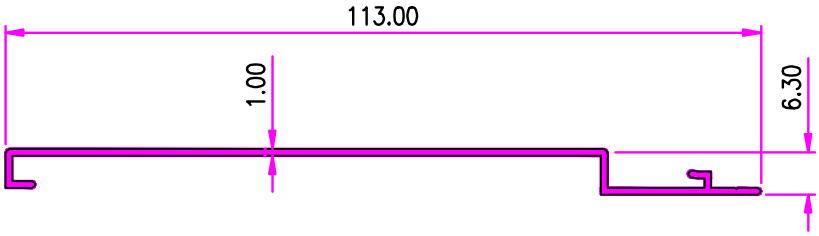


DIE 9578

W : 0.956 KG/M
P : 453.01 MM

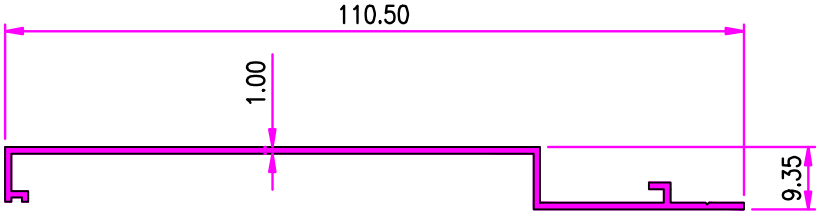
SPANDREL SECTIONS

GROUP : 13C-2



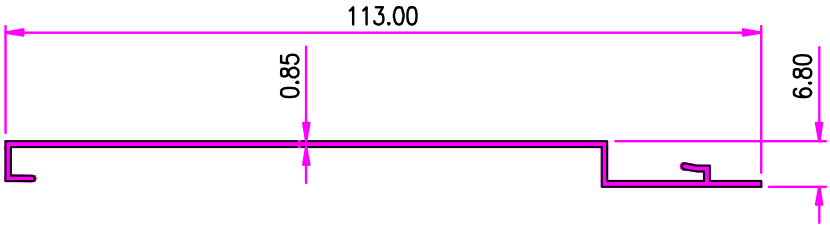
DIE 7073

W : 0.359 KG/M
P : 269.60 MM



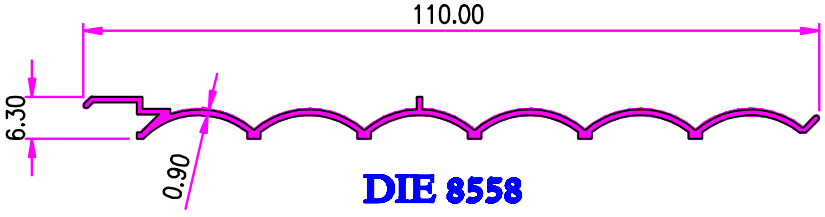
DIE 7118

W : 0.360 KG/M
P : 275.20 MM



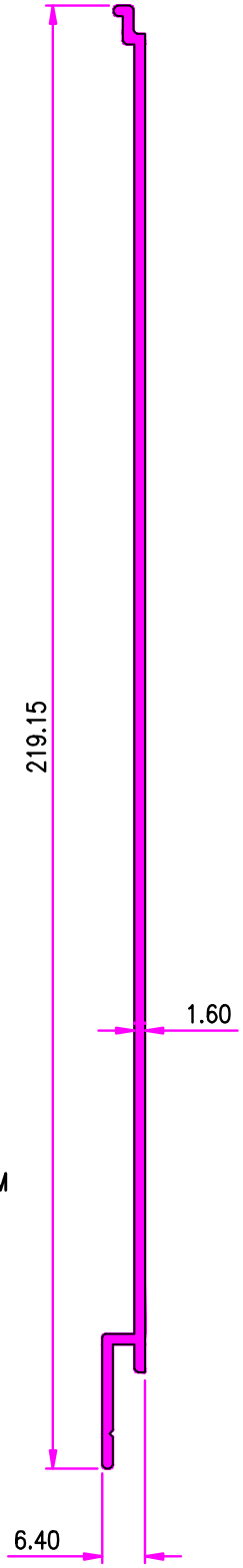
DIE X 1705

W : 0.305 KG/M
P : 269.60 MM



DIE 8558

W : 0.348 KG/M
P : 304.00 MM



DIE 9576

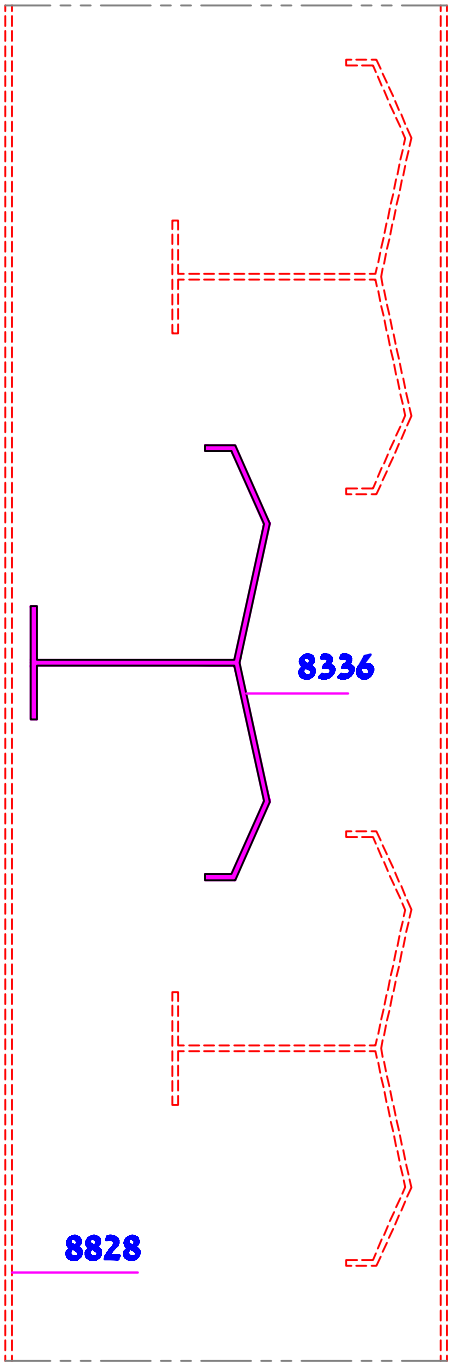
W : 1.000 KG/M
P : 464.18 MM

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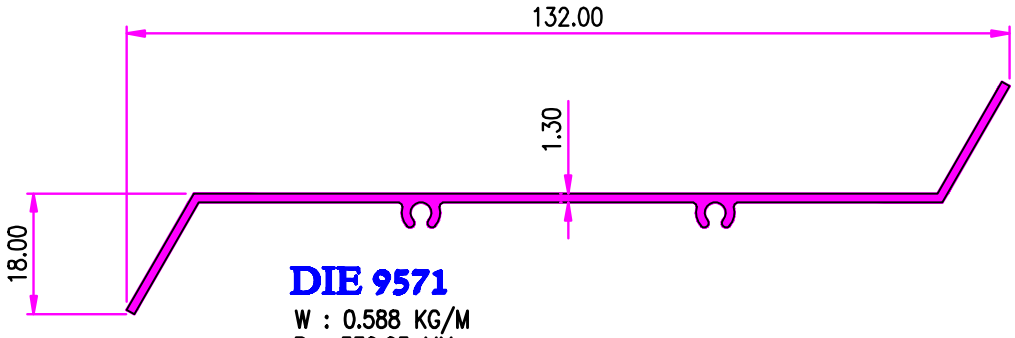
LOUVRE OR SUN SCREEN ASSEMBLY DETAIL

GROUP : 13D-1



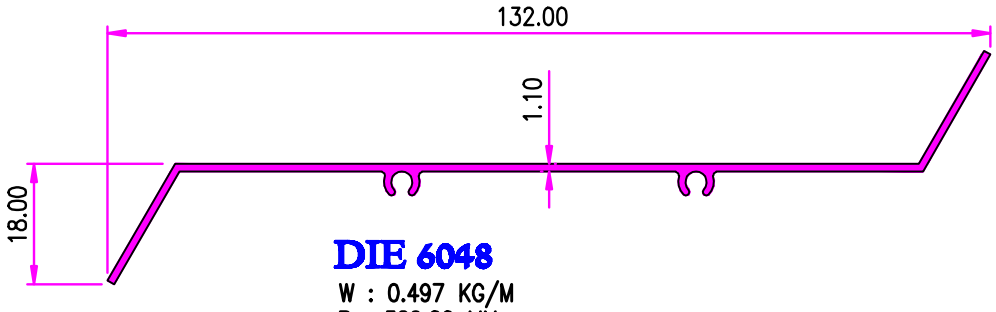
LOUVRE SECTIONS

GROUP : 13E-1



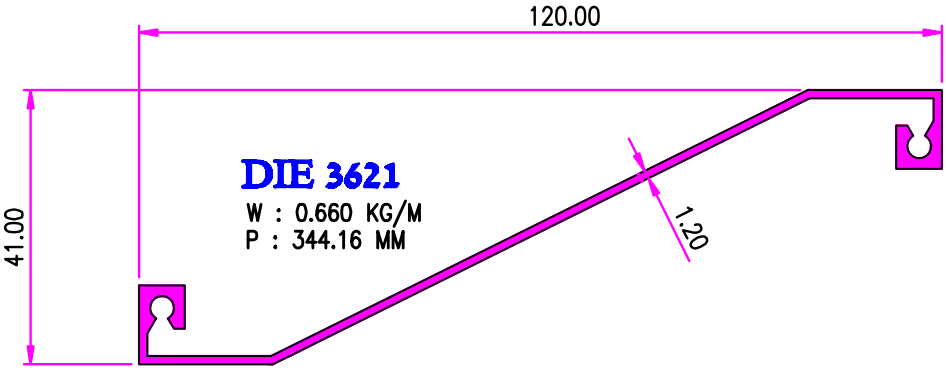
DIE 9571

W : 0.588 KG/M
P : 330.05 MM



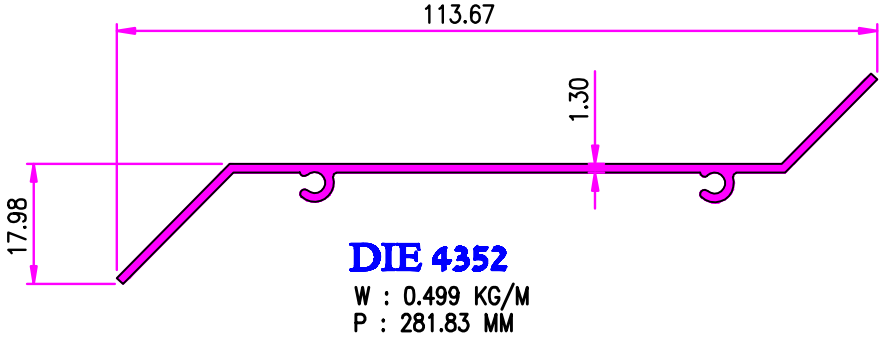
DIE 6048

W : 0.497 KG/M
P : 329.00 MM



DIE 3621

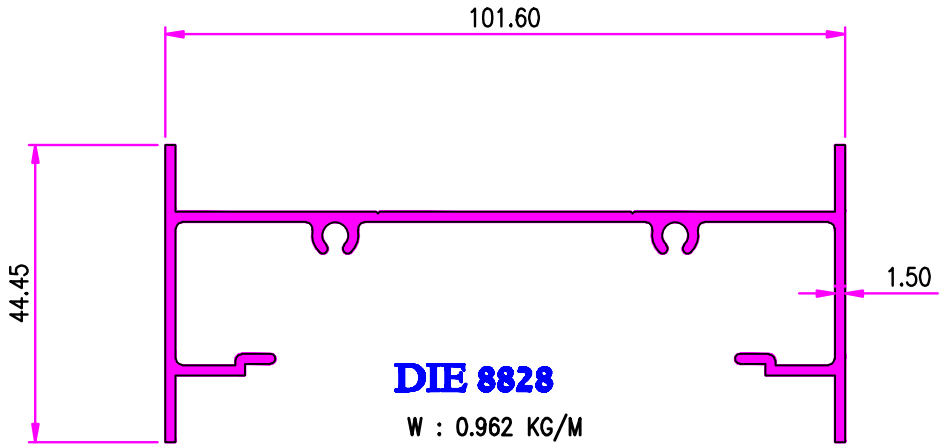
W : 0.660 KG/M
P : 344.16 MM



DIE 4352

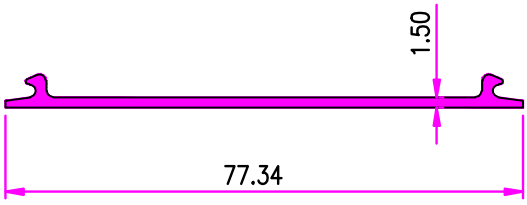
W : 0.499 KG/M
P : 281.83 MM

LOUVRE SECTIONS **GROUP : 13E-2**



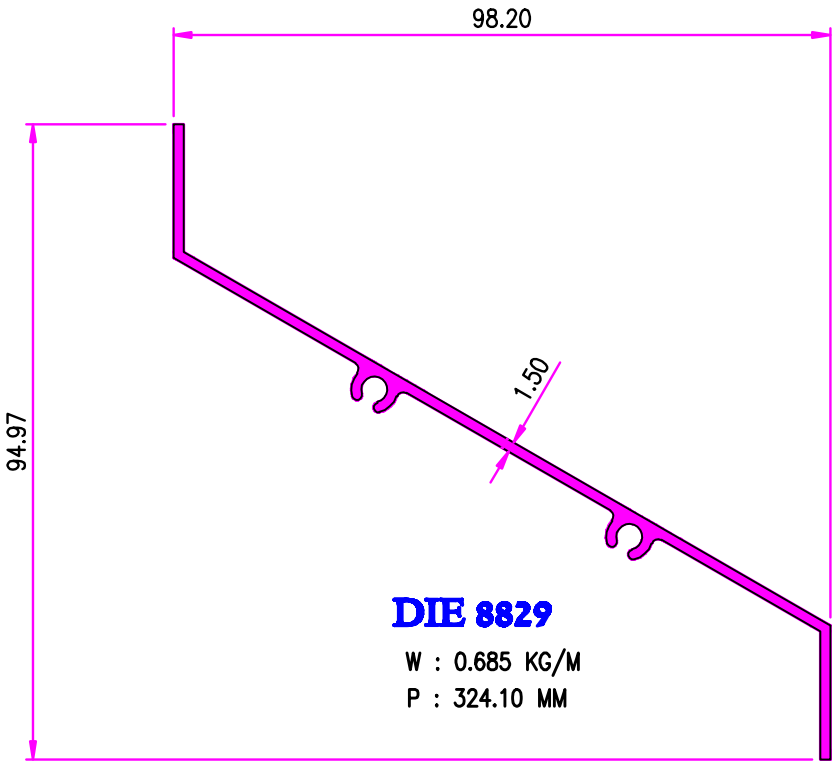
DIE 8828

W : 0.962 KG/M
P : 474.46 MM



DIE 6099

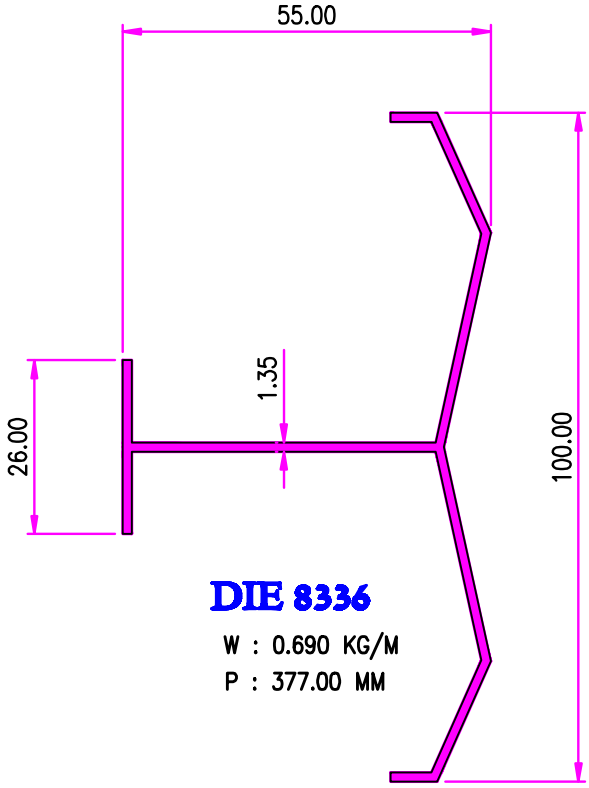
W : 0.376 KG/M
P : 182.47 MM



DIE 8829

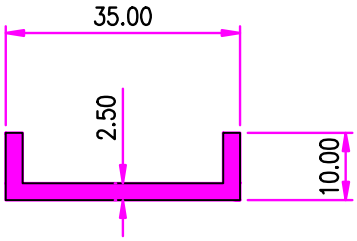
W : 0.685 KG/M
P : 324.10 MM

LOUVRE SECTIONS **GROUP : 13E-3**



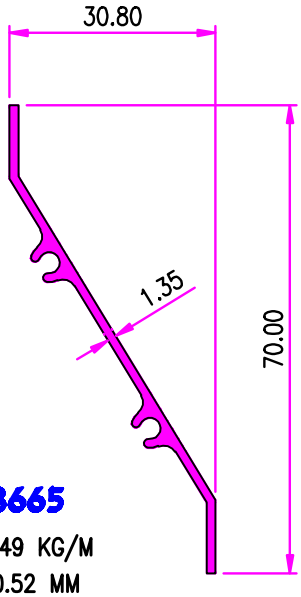
DIE 8336

W : 0.690 KG/M
P : 377.00 MM



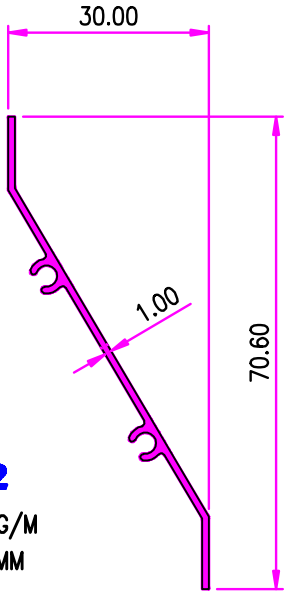
DIE 1037

W : 0.340 KG/M
P : 105.00 MM



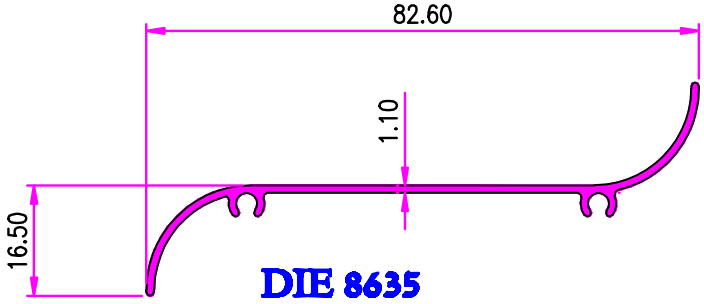
DIE 8665

W : 0.349 KG/M
P : 180.52 MM



DIE 7072

W : 0.280 KG/M
P : 184.04 MM

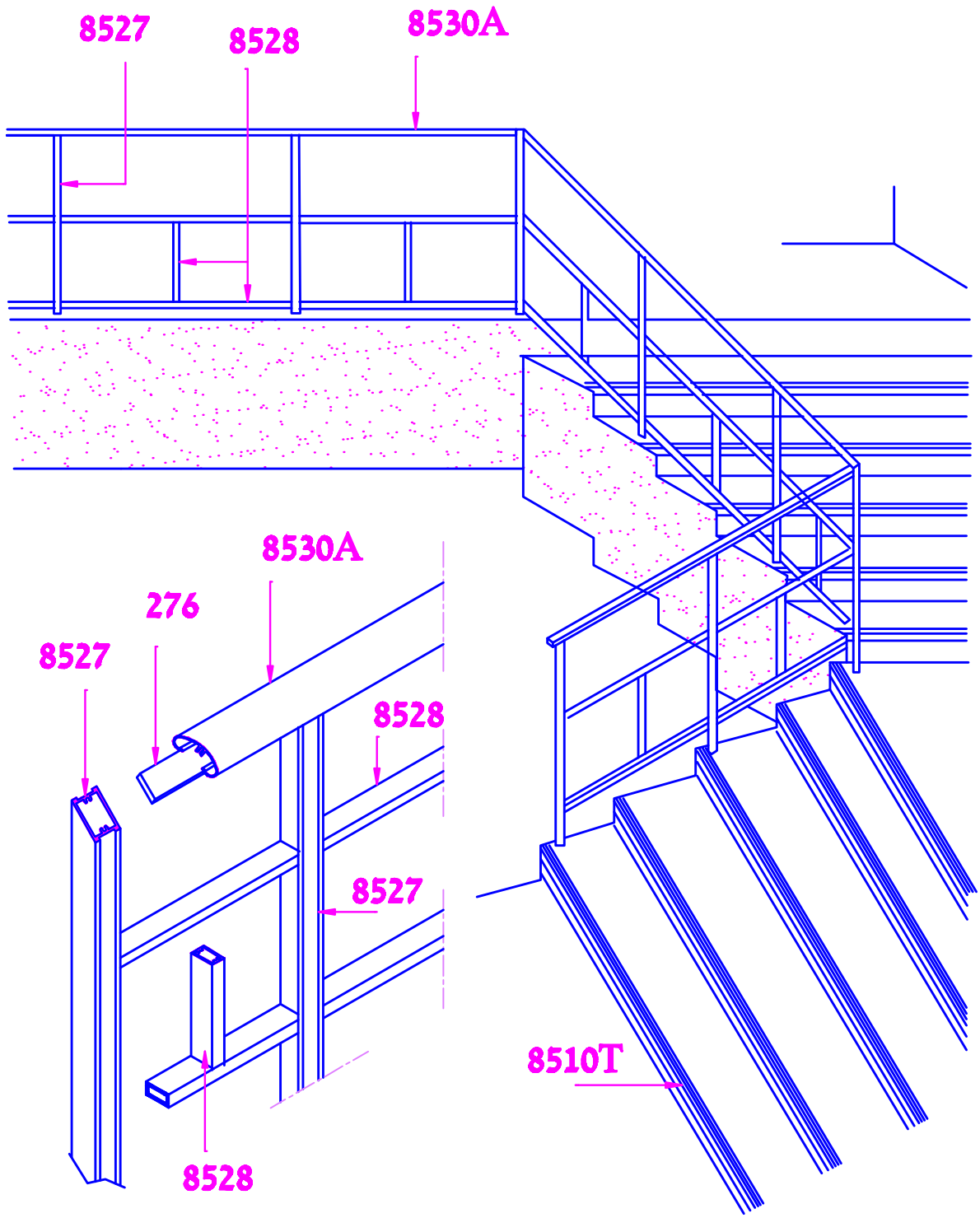


DIE 8635

W : 0.345 KG/M
P : 226.37 MM

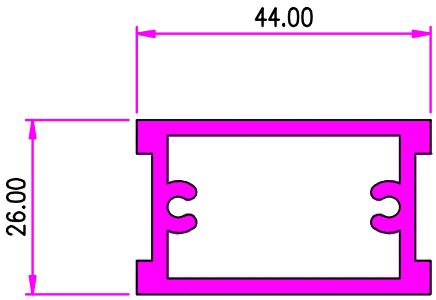
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HAND RAILING PERSPECTIVE ASSEMBLY DETAIL GROUP : 13F-1



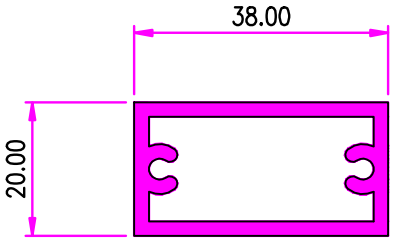
HAND RAILING SECTIONS

GROUP : 13G-1



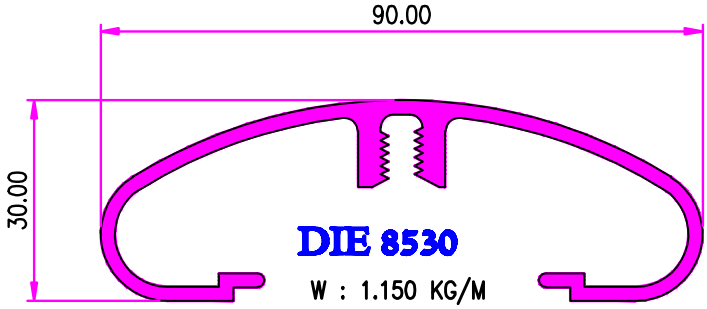
DIE 8527

W : 0.990 KG/M
P : 149.20 MM



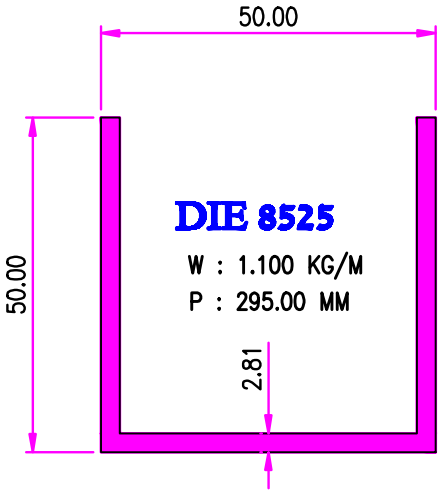
DIE 8528

W : 0.740 KG/M
P : 116.00 MM



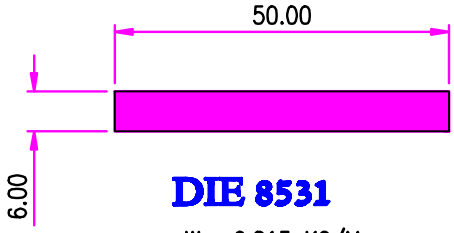
DIE 8530

W : 1.150 KG/M
P : 383.82 MM



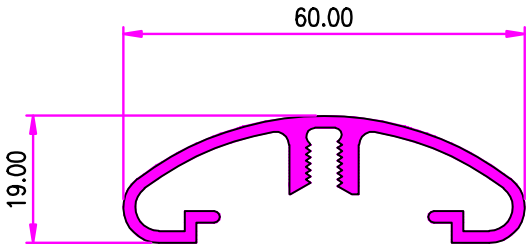
DIE 8525

W : 1.100 KG/M
P : 295.00 MM



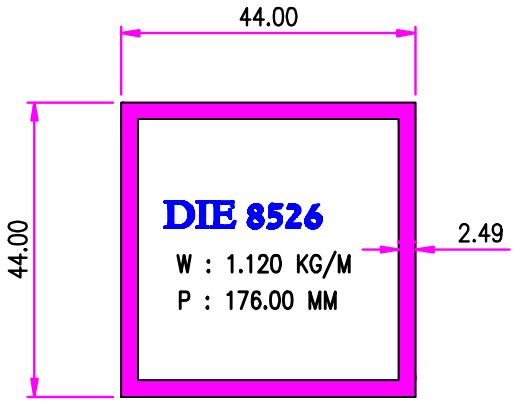
DIE 8531

W : 0.813 KG/M
P : 112.00 MM



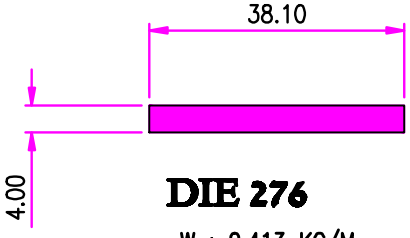
DIE 8530A

W : 0.691 KG/M
P : 245.00 MM



DIE 8526

W : 1.120 KG/M
P : 176.00 MM

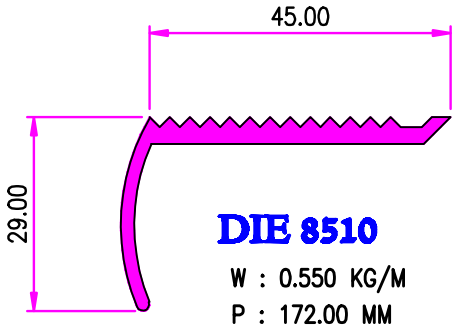


DIE 276

W : 0.413 KG/M
P : 84.20 MM

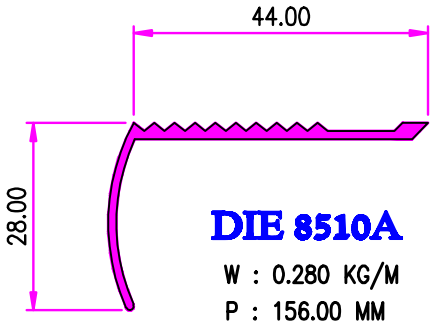
STAIRNOSING SECTIONS

GROUP : 13H-1



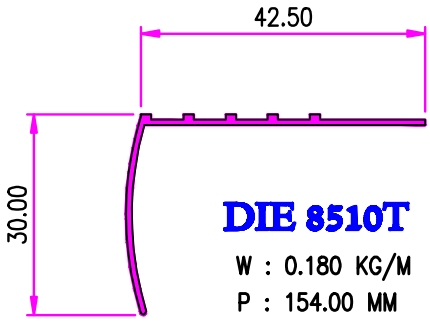
DIE 8510

W : 0.550 KG/M
P : 172.00 MM



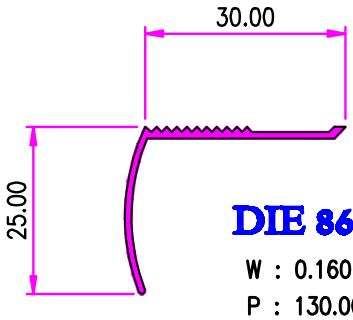
DIE 8510A

W : 0.280 KG/M
P : 156.00 MM



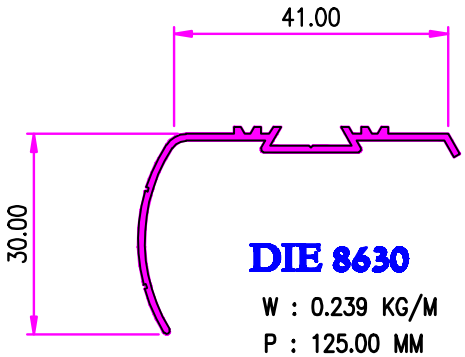
DIE 8510T

W : 0.180 KG/M
P : 154.00 MM



DIE 8603

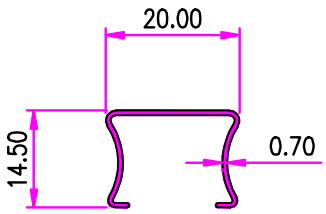
W : 0.160 KG/M
P : 130.00 MM



DIE 8630

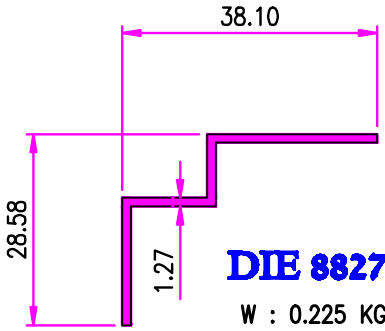
W : 0.239 KG/M
P : 125.00 MM

OTHERS **GROUP : 13I-1**



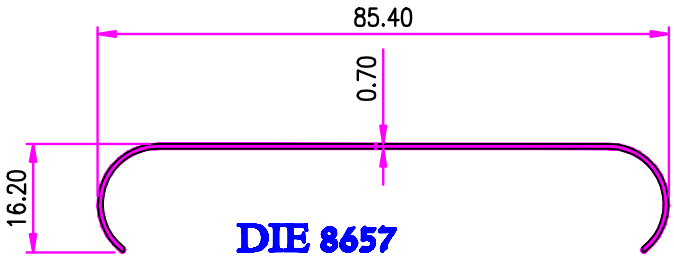
DIE 8658

W : 0.110 KG/M
P : 116.40 MM



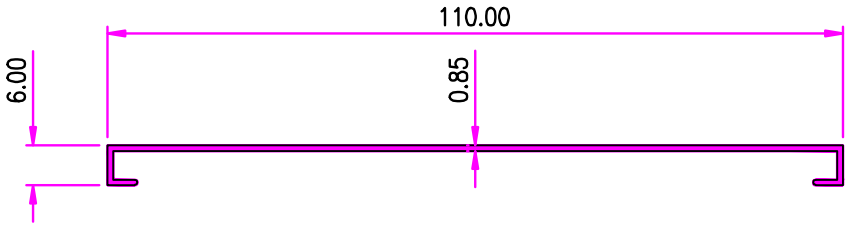
DIE 8827

W : 0.225 KG/M
P : 135.90 MM



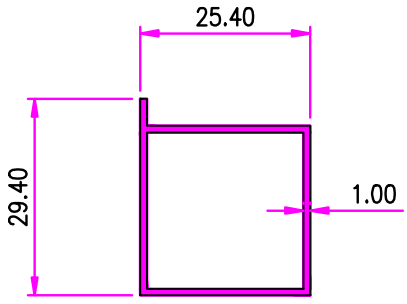
DIE 8657

W : 0.216 KG/M
P : 229.40 MM



DIE X-1706

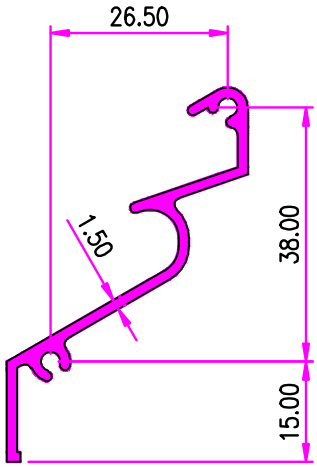
W : 0.291 KG/M
P : 257.20 MM



DIE X-1707

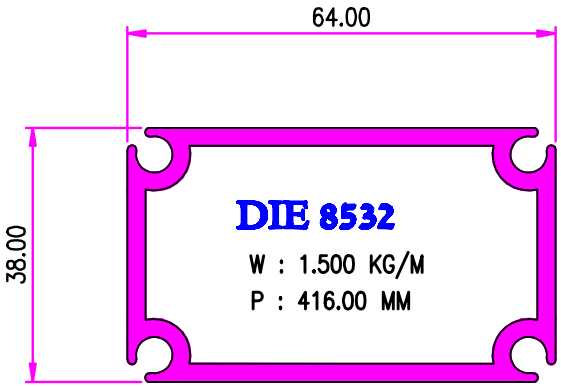
W : 0.276 KG/M
P : 109.60 MM

OTHERS **GROUP : 13I-2**



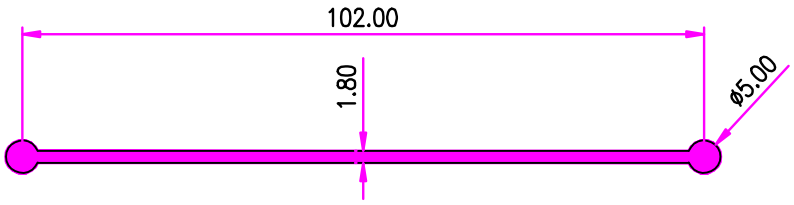
DIE 8506

W : 0.470 KG/M
P : 178.00 MM



DIE 8532

W : 1.500 KG/M
P : 416.00 MM



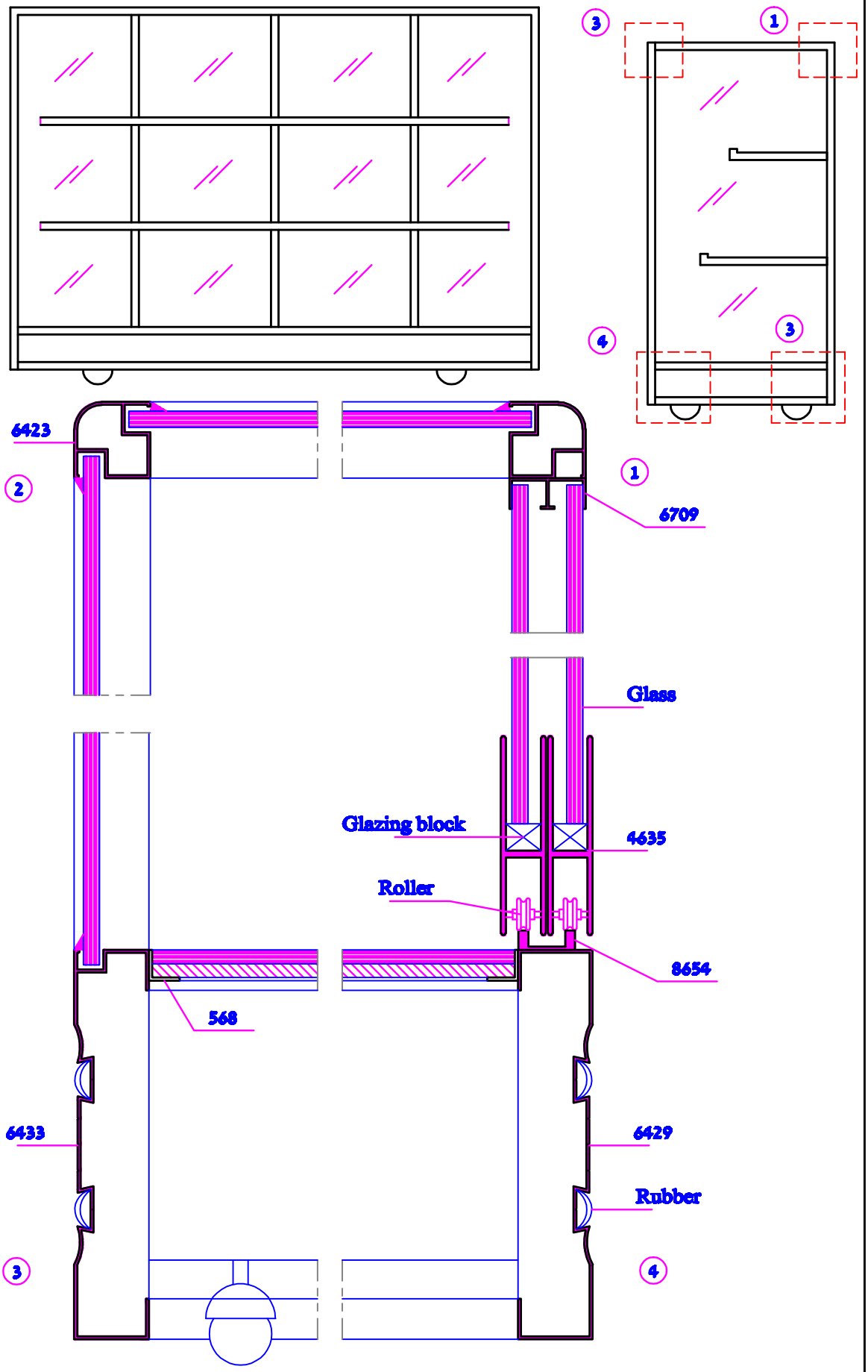
DIE 8533

W : 0.690 KG/M
P : 222.00 MM

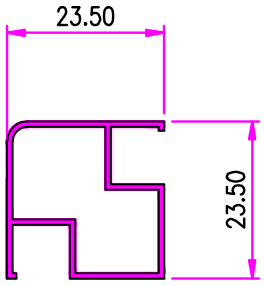
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

SHOW CASE ASSEMBLY DETAIL

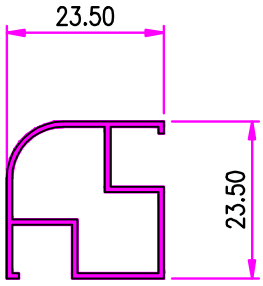
GROUP : 14A-1



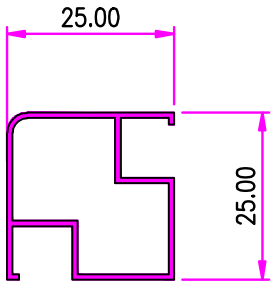
SHOW CASE SECTIONS 0.80 MM THICK — GROUP : 14B-1



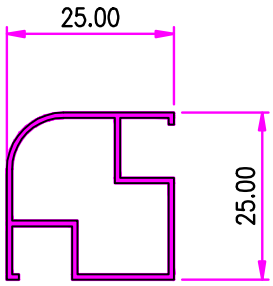
DIE 6350
W : 0.231 KG/M
P : 126.43 MM



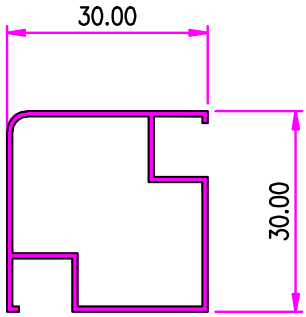
DIE 6351
W : 0.226 KG/M
P : 124.07 MM



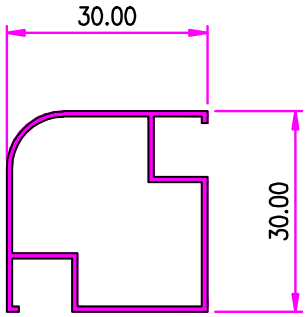
DIE 6354
W : 0.246 KG/M
P : 134.03 MM



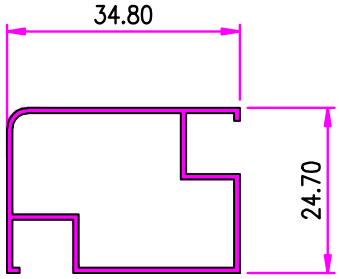
DIE 6342
W : 0.241 KG/M
P : 131.67 MM



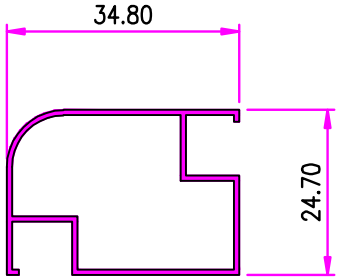
DIE 6353
W : 0.289 KG/M
P : 154.03 MM



DIE 6343
W : 0.284 KG/M
P : 151.67 MM

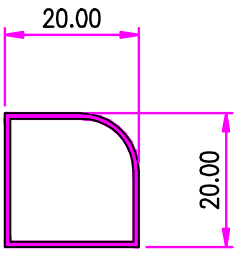


DIE 6355
W : 0.288 KG/M
P : 153.43 MM

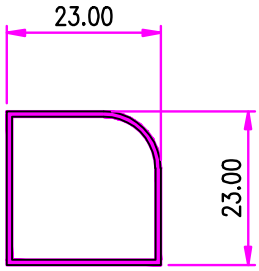


DIE 6349
W : 0.283 KG/M
P : 151.07 MM

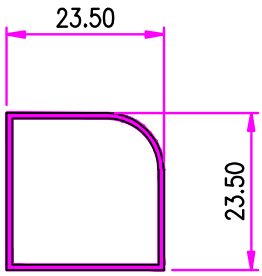
SHOW CASE SECTIONS 0.80 MM THICK — GROUP : 14B-2



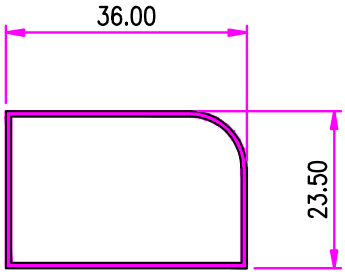
DIE 6356
W : 0.159 KG/M
P : 76.35 MM



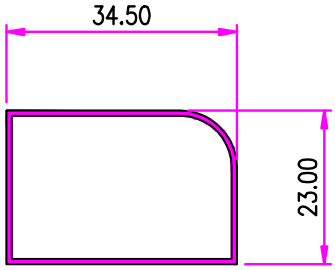
DIE 6357
W : 0.185 KG/M
P : 88.35 MM



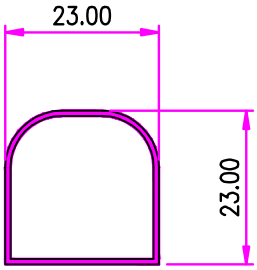
DIE 6347
W : 0.189 KG/M
P : 90.35 MM



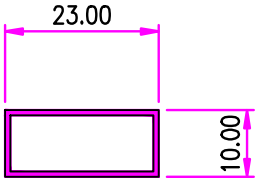
DIE 6352
W : 0.244 KG/M
P : 115.35 MM



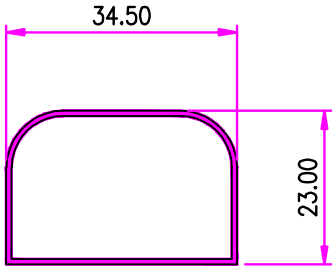
DIE 6341
W : 0.235 KG/M
P : 111.35 MM



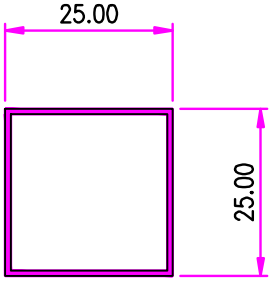
DIE 4338
W : 0.177 KG/M
P : 84.70 MM



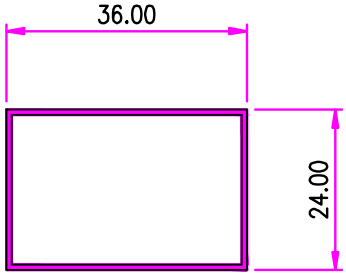
DIE 6345
W : 0.136 KG/M
P : 66.00 MM



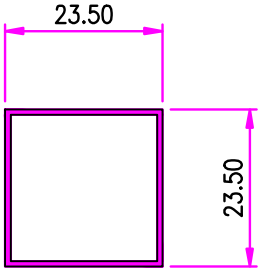
DIE 4339
W : 0.227 KG/M
P : 127.70 MM



DIE 6344
W : 0.210 KG/M
P : 100.00 MM

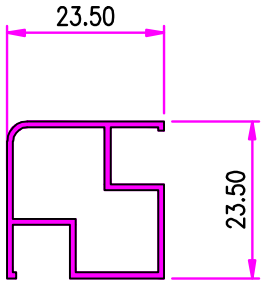


DIE 6340
W : 0.253 KG/M
P : 120.00 MM

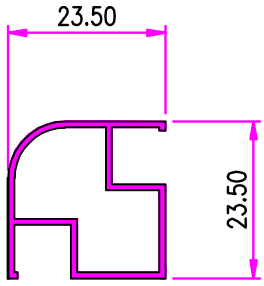


DIE 6348
W : 0.197 KG/M
P : 94.00 MM

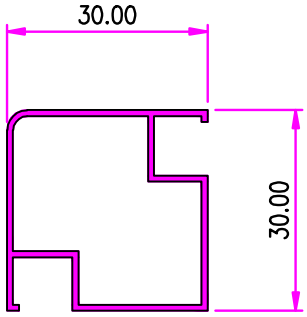
SHOW CASE SECTIONS 0.90 MM THICK — GROUP : 14B-3



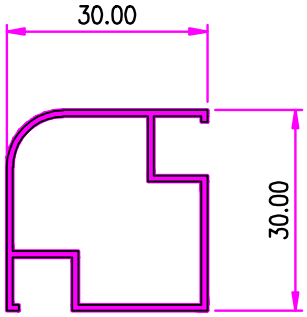
DIE 6422
W : 0.259 KG/M
P : 125.94 MM



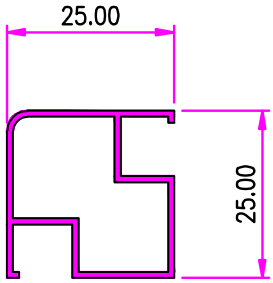
DIE 6423
W : 0.253 KG/M
P : 123.58 MM



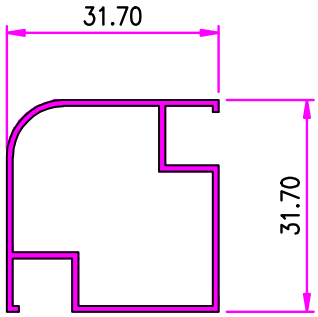
DIE 6426
W : 0.324 KG/M
P : 153.54 MM



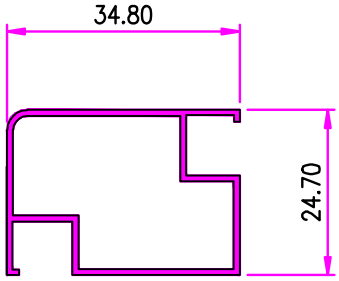
DIE 6313
W : 0.318 KG/M
P : 151.18 MM



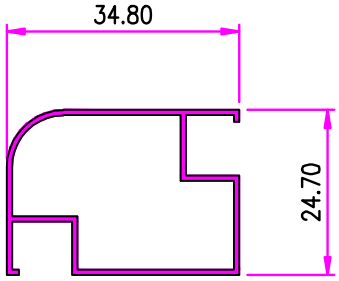
DIE 6427
W : 0.275 KG/M
P : 133.54 MM



DIE 4213
W : 0.335 KG/M
P : 157.98 MM



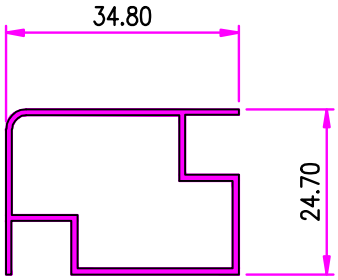
DIE 6428
W : 0.322 KG/M
P : 152.94 MM



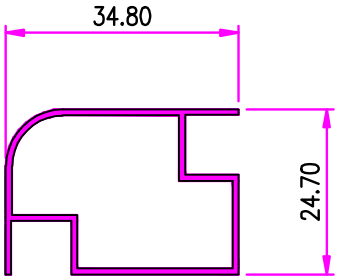
DIE 6421
W : 0.316 KG/M
P : 150.58 MM

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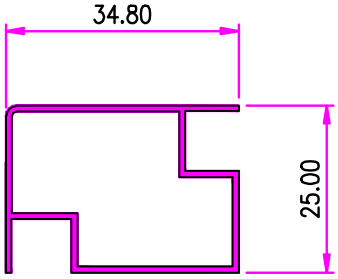
SHOW CASE SECTIONS 0.90 MM THICK — GROUP : 14B-4



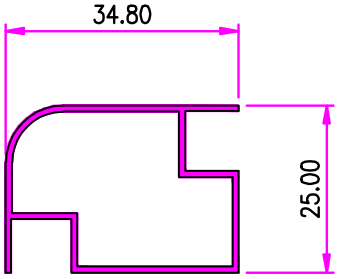
DIE 6412
W : 0.317 KG/M
P : 149.71 MM



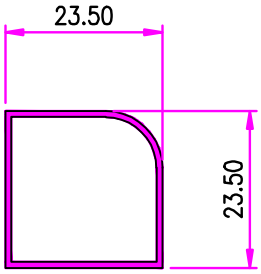
DIE 6416
W : 0.312 KG/M
P : 147.35 MM



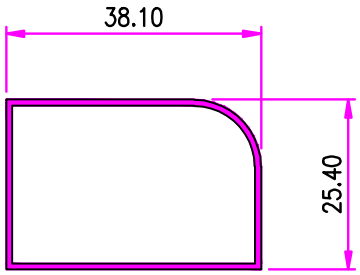
DIE 4216
W : 0.320 KG/M
P : 150.96 MM



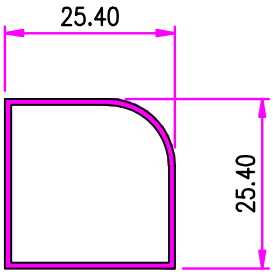
DIE 4215
W : 0.313 KG/M
P : 147.95 MM



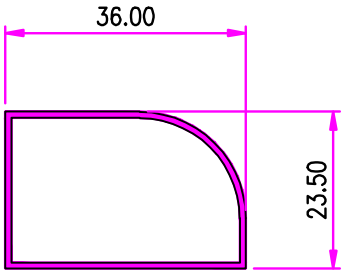
DIE 6317
W : 0.212 KG/M
P : 90.35 MM



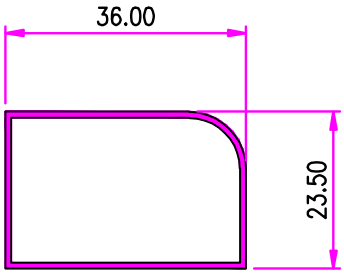
DIE 4219
W : 0.292 KG/M
P : 123.14 MM



DIE 4220
W : 0.229 KG/M
P : 97.31 MM



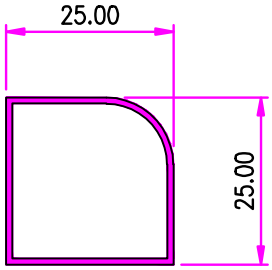
DIE 6411
W : 0.265 KG/M
P : 112.18 MM



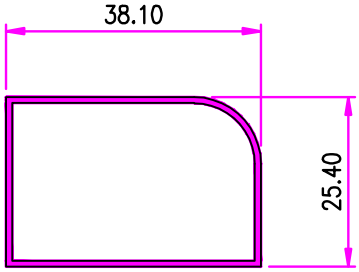
DIE 6424
W : 0.273 KG/M
P : 115.14 MM

SHOW CASE SECTIONS 1.00 MM THICK

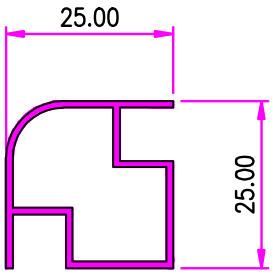
GROUP : 14B-5



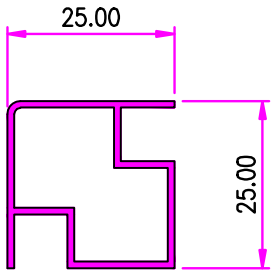
DIE 8626
W : 0.250 KG/M
P : 186.60 MM



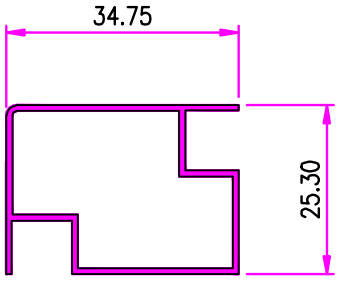
DIE 4601
W : 0.332 KG/M
P : 123.14 MM



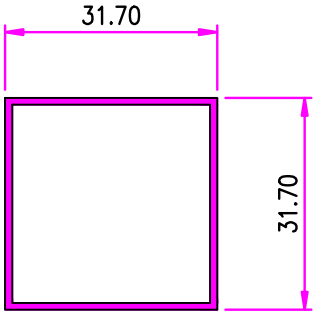
DIE 8660
W : 0.296 KG/M
P : 221.60 MM



DIE 8659
W : 0.301 KG/M
P : 224.00 MM

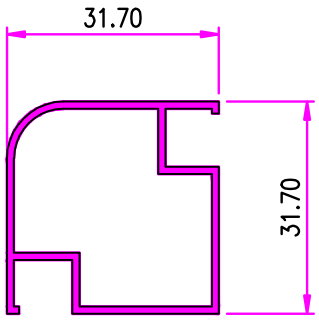


DIE 7124
W : 0.356 KG/M
P : 151.03 MM

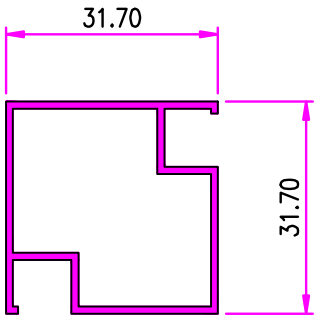


DIE 4518
W : 0.333 KG/M
P : 126.80 MM

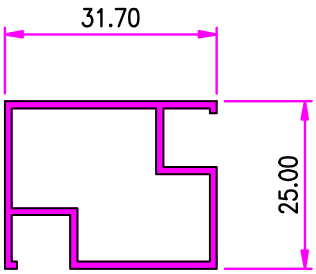
SHOW CASE SECTIONS 1.05 MM THICK — GROUP : 14B-6



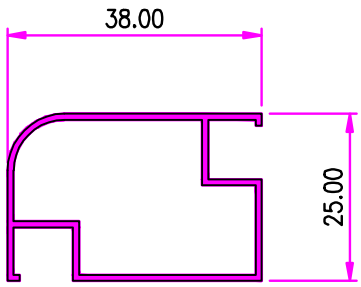
DIE 8705
W : 0.386 KG/M
P : 277.76 MM



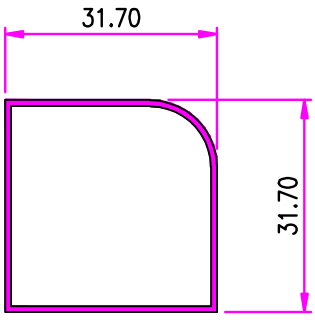
DIE 8644
W : 0.386 KG/M
P : 277.76 MM



DIE 8643
W : 0.386 KG/M
P : 277.76 MM



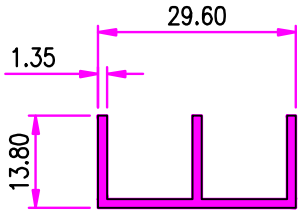
DIE 8704
W : 0.386 KG/M
P : 277.76 MM



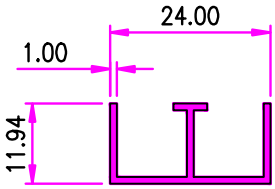
DIE 8703
P : 245.20 MM
W : 0.349 KG/M

SHOW CASE SECTIONS

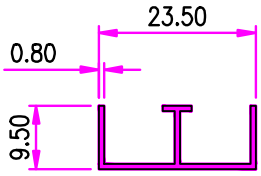
GROUP : 14B-7



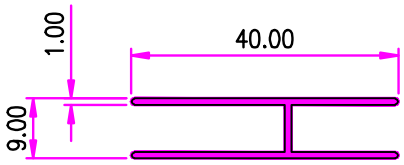
DIE 8573
W : 0.250 KG/M
P : 138.00 MM



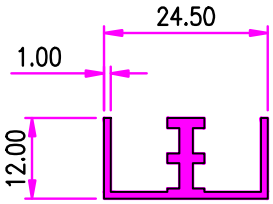
DIE 8640
W : 0.165 KG/M
P : 124.64 MM



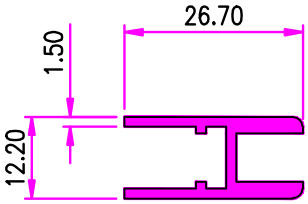
DIE 6709
W : 0.115 KG/M
P : 107.80 MM



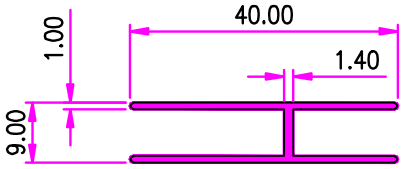
DIE 8260
W : 0.235 KG/M
P : 174.28 MM



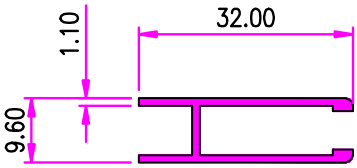
DIE 8570
W : 0.220 KG/M
P : 90.00 MM



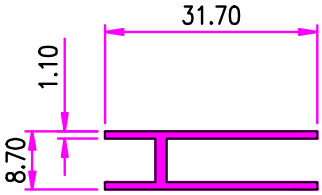
DIE 8571
W : 0.320 KG/M
P : 132.00 MM



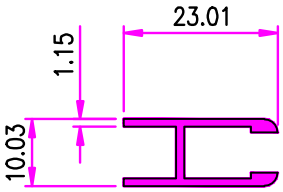
DIE 4635
W : 0.242 KG/M
P : 173.48 MM



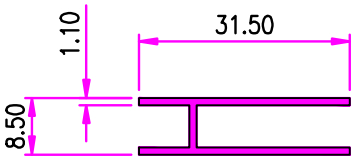
DIE 7182
W : 0.224 KG/M
P : 146.40 MM



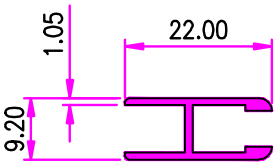
DIE 8588
W : 0.218 KG/M
P : 141.00 MM



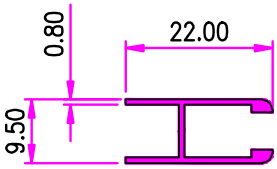
DIE 8585
W : 0.191 KG/M
P : 109.24 MM



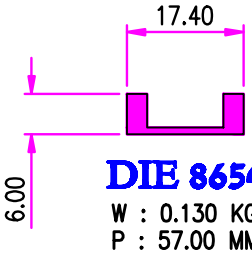
DIE 8651
W : 0.209 KG/M
P : 141.00 MM



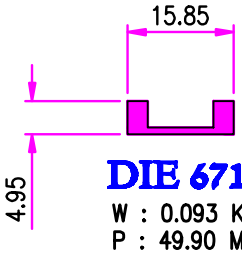
DIE 8646
W : 0.166 KG/M
P : 108.00 MM



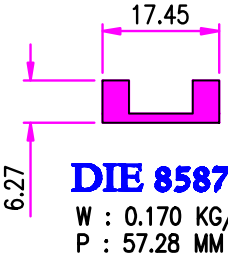
DIE 6710
W : 0.130 KG/M
P : 108.71 MM



DIE 8654
W : 0.130 KG/M
P : 57.00 MM

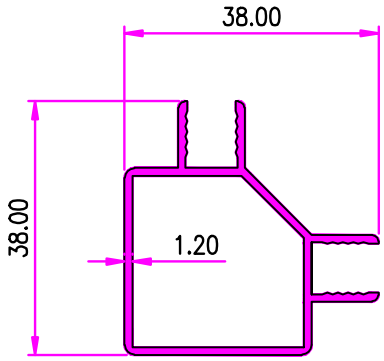


DIE 6711
W : 0.093 KG/M
P : 49.90 MM

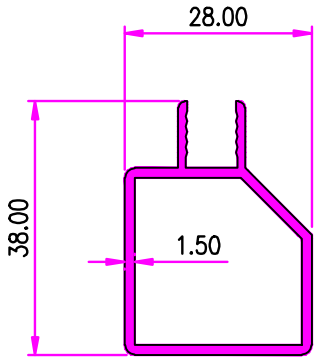


DIE 8587
W : 0.170 KG/M
P : 57.28 MM

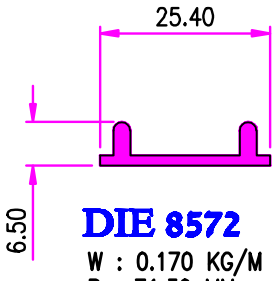
SHOW CASE SECTIONS **GROUP : 14B-8**



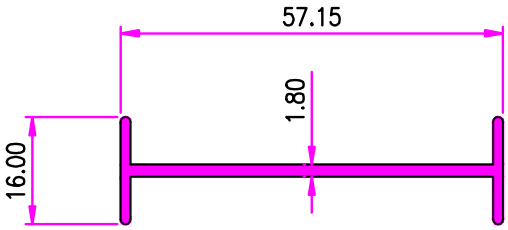
DIE 7125
W : 0.467 KG/M
P : 195.00 MM



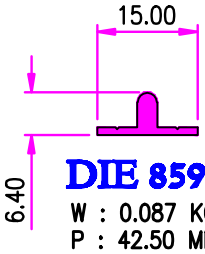
DIE 7126
W : 0.400 KG/M
P : 153.00 MM



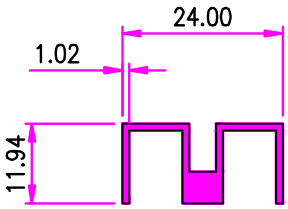
DIE 8572
W : 0.170 KG/M
P : 71.30 MM



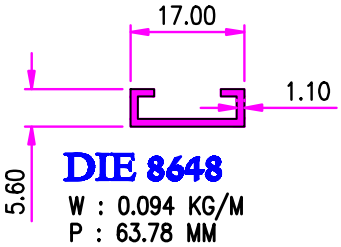
DIE 8574
W : 0.390 KG/M
P : 175.00 MM



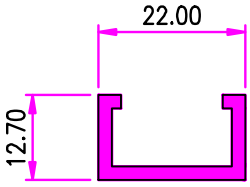
DIE 8596
W : 0.087 KG/M
P : 42.50 MM



DIE 8586
W : 0.228 KG/M
P : 129.90 MM



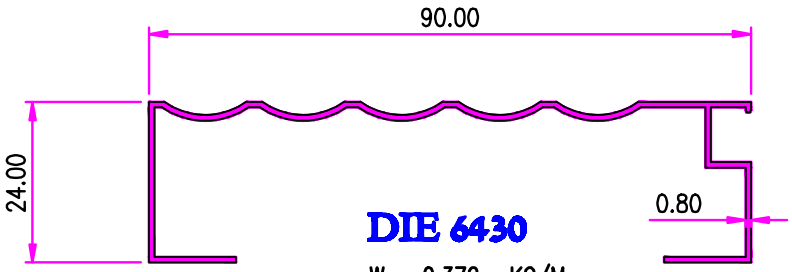
DIE 8648
W : 0.094 KG/M
P : 63.78 MM



DIE 8599
W : 0.266 KG/M
P : 96.30 MM

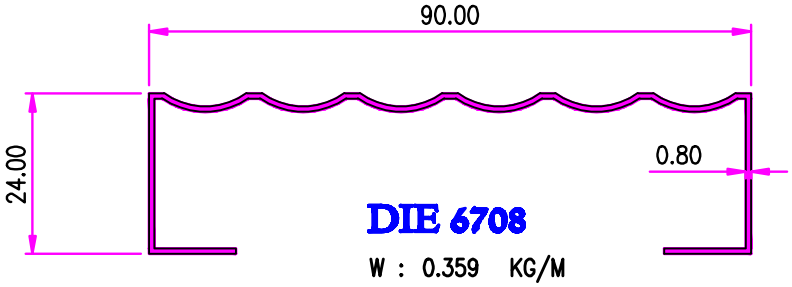
SHOW CASE SECTIONS 0.80 MM THICK

GROUP : 14B-9



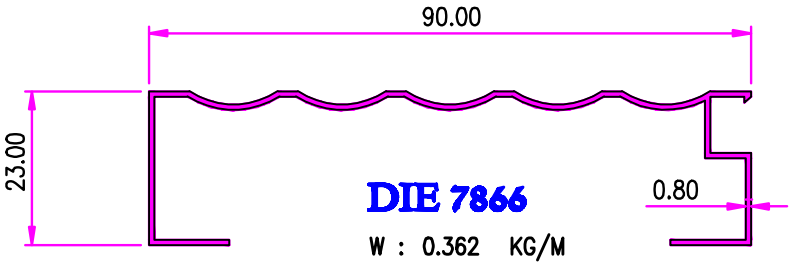
DIE 6430

W : 0.372 KG/M
P : 344.70 MM



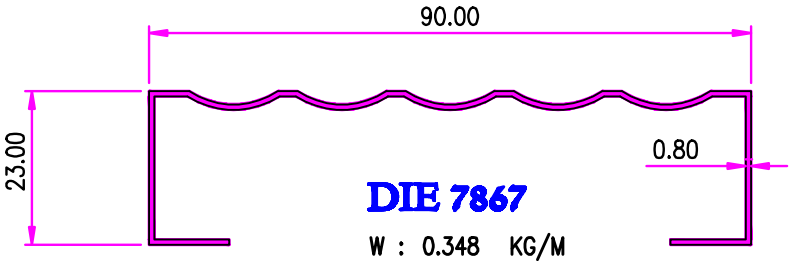
DIE 6708

W : 0.359 KG/M
P : 333.10 MM



DIE 7866

W : 0.362 KG/M
P : 335.33 MM

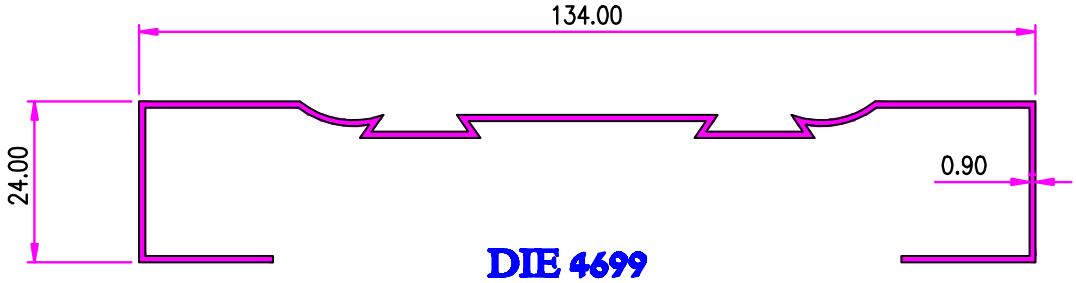


DIE 7867

W : 0.348 KG/M
P : 322.78 MM

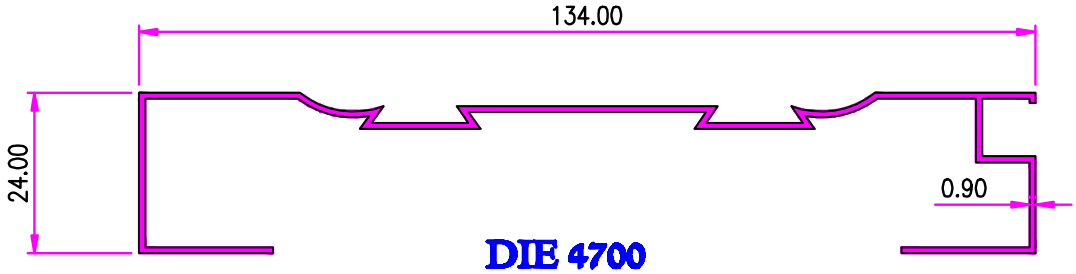
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SHOW CASE SECTIONS 0.90 MM THICK — GROUP : 14B-10



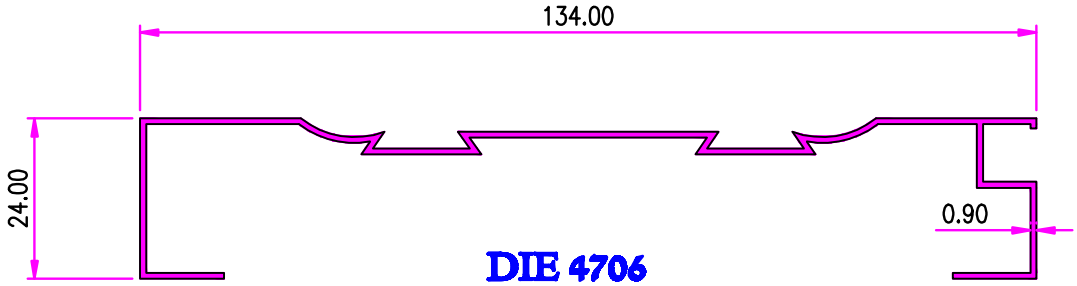
DIE 4699

W : 0.580 KG/M
P : 477.41 MM



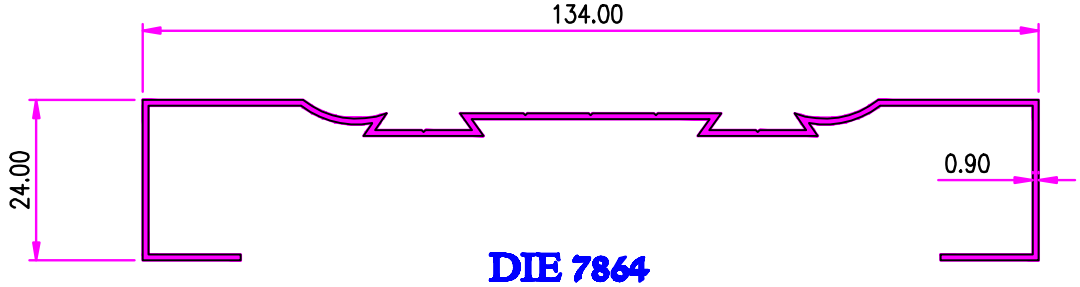
DIE 4700

W : 0.600 KG/M
P : 494.61 MM



DIE 4706

W : 0.564 KG/M
P : 464.61 MM

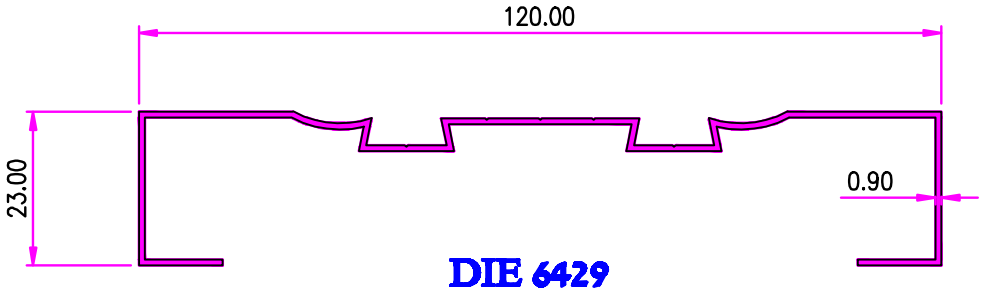


DIE 7864

W : 0552 KG/M
P : 457.45 MM

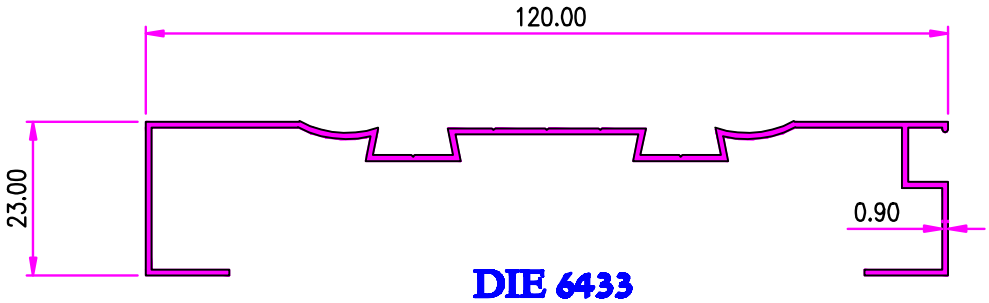
SHOW CASE SECTIONS 0.90 MM THICK

GROUP : 14B-11



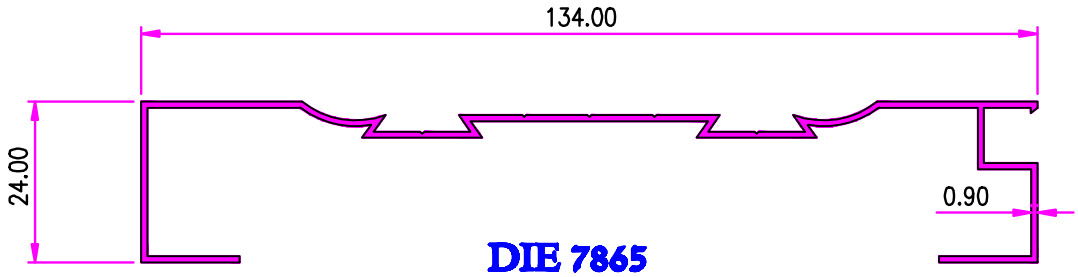
DIE 6429

W : 0.504 KG/M
P : 417.16 MM



DIE 6433

W : 0.520 KG/M
P : 430.17 MM

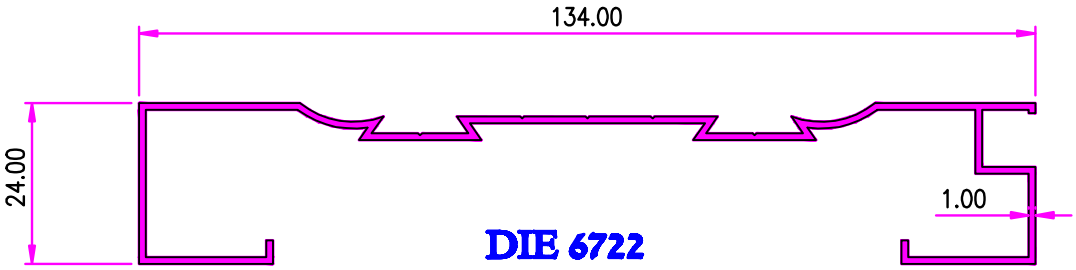


DIE 7865

W : 0.573 KG/M
P : 473.45 MM

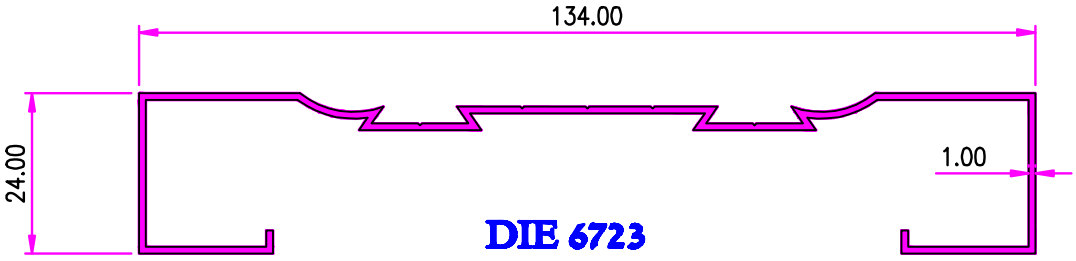
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SHOW CASE SECTIONS 1.00 MM THICK — GROUP : 14B-12



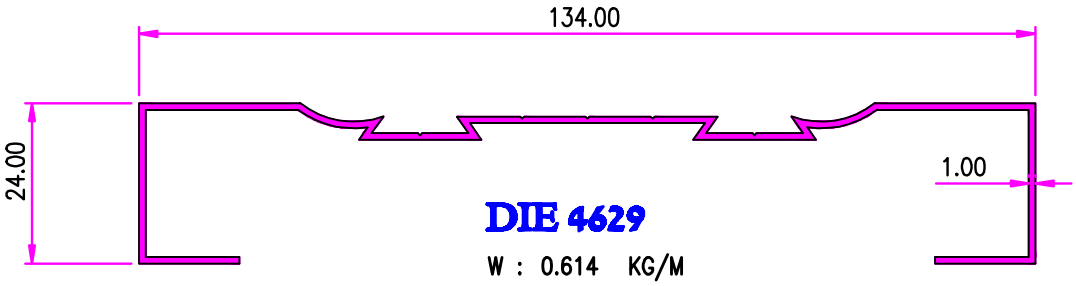
DIE 6722

W : 0.678 KG/M
P : 504.90 MM



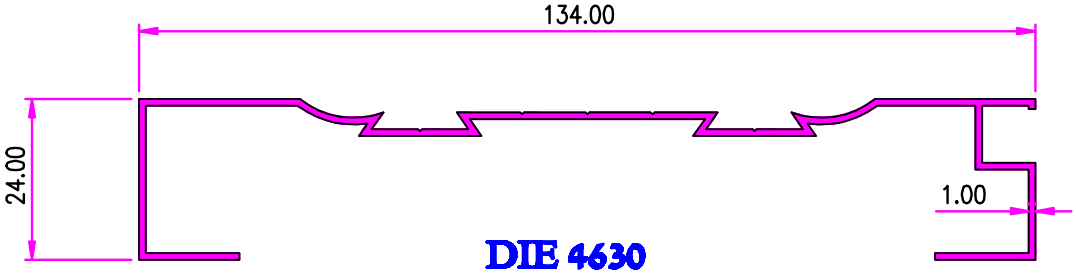
DIE 6723

W : 0.655 KG/M
P : 487.90 MM



DIE 4629

W : 0.614 KG/M
P : 457.90 MM

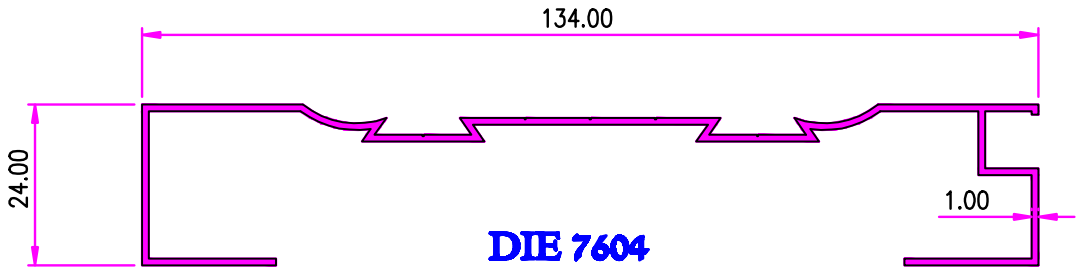


DIE 4630

W : 0.637 KG/M
P : 474.90 MM

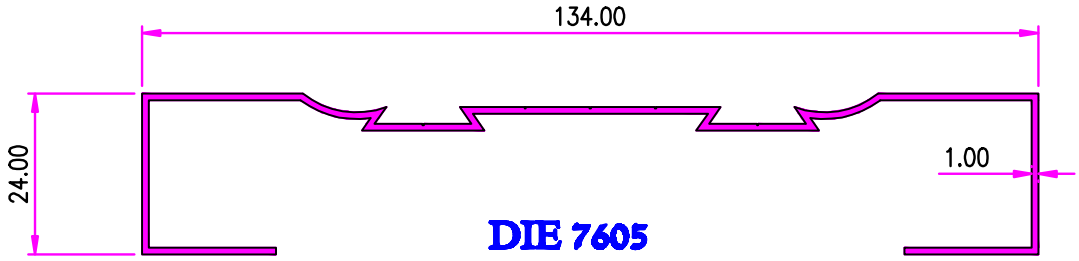
SHOW CASE SECTIONS 1.00 MM THICK

GROUP : 14B-13



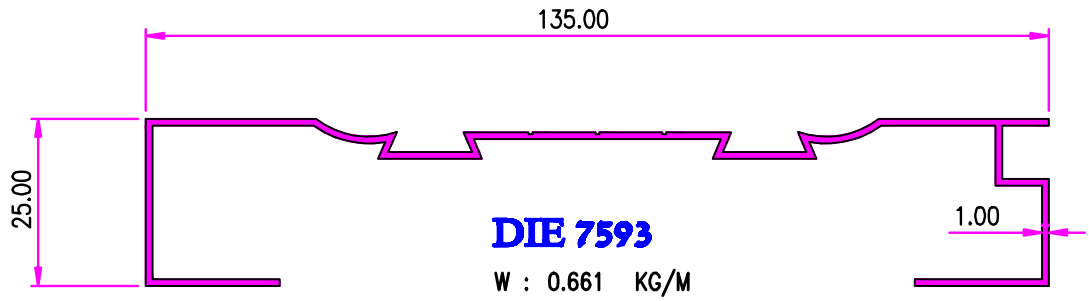
DIE 7604

W : 0.666 KG/M
P : 503.00 MM



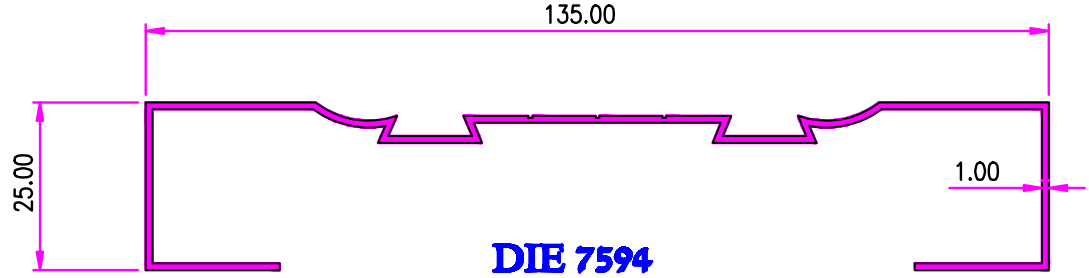
DIE 7605

W : 0.642 KG/M
P : 479.20 MM



DIE 7593

W : 0.661 KG/M
P : 494.60 MM

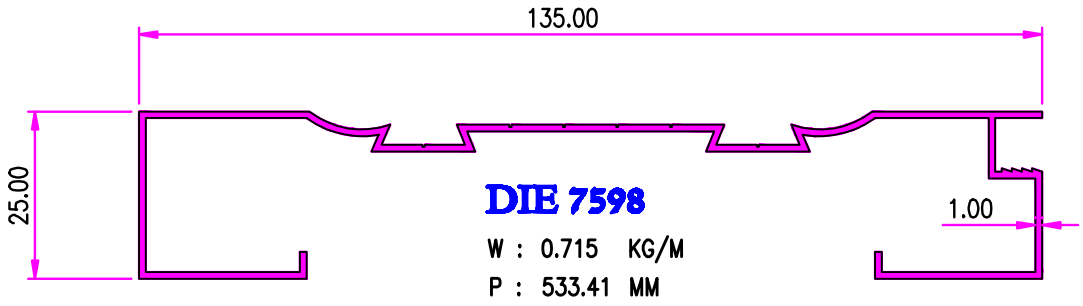


DIE 7594

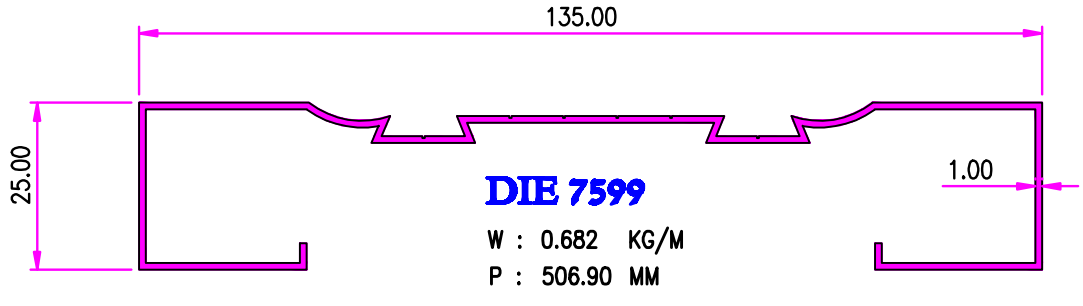
W : 0.639 KG/M
P : 478.90 MM

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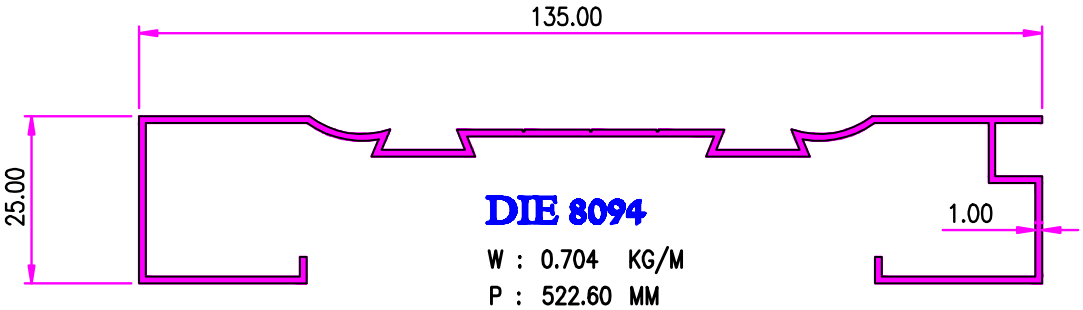
SHOW CASE SECTIONS 1.00 MM THICK — GROUP : 14B-14



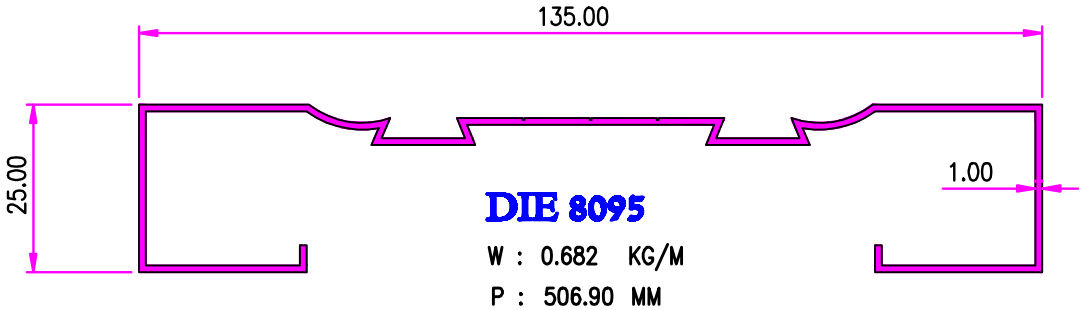
DIE 7598
W : 0.715 KG/M
P : 533.41 MM



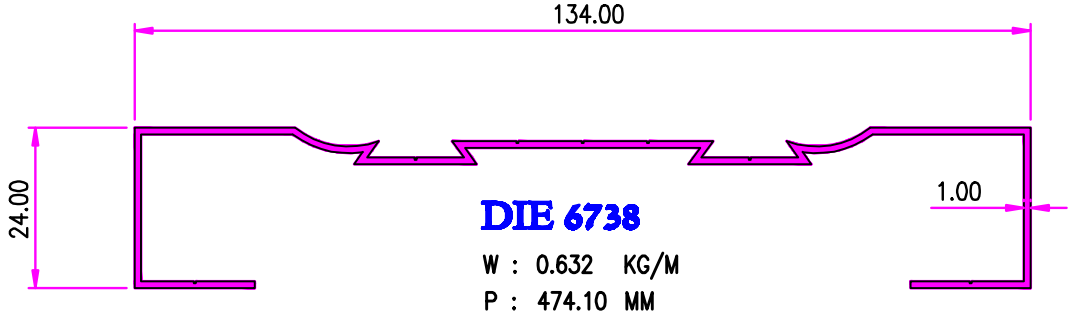
DIE 7599
W : 0.682 KG/M
P : 506.90 MM



DIE 8094
W : 0.704 KG/M
P : 522.60 MM



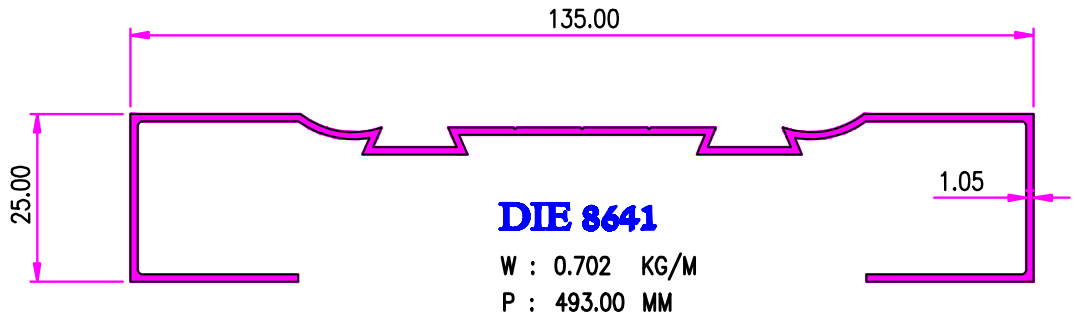
DIE 8095
W : 0.682 KG/M
P : 506.90 MM



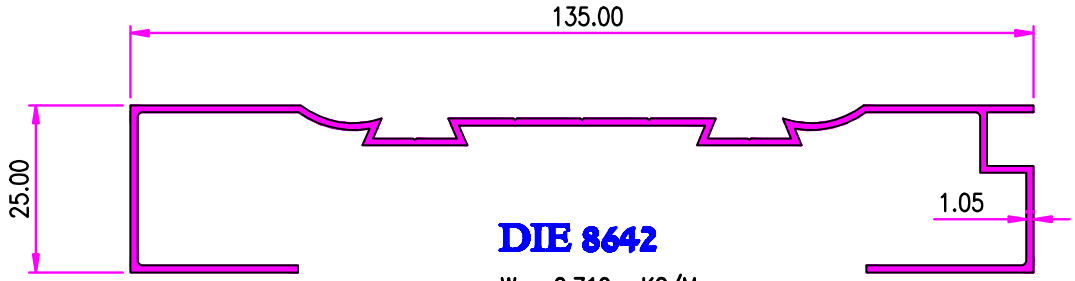
DIE 6738
W : 0.632 KG/M
P : 474.10 MM

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

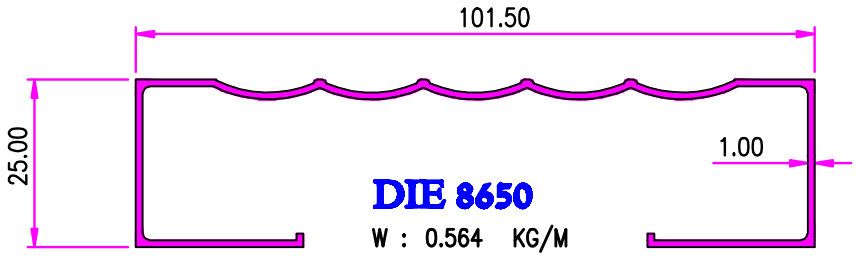
SHOW CASE SECTIONS — GROUP : 14B-15



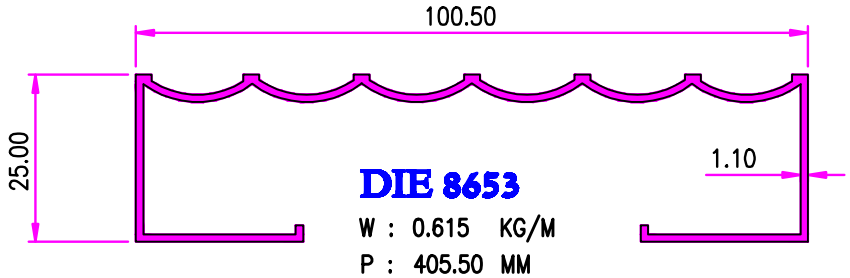
DIE 8641
W : 0.702 KG/M
P : 493.00 MM



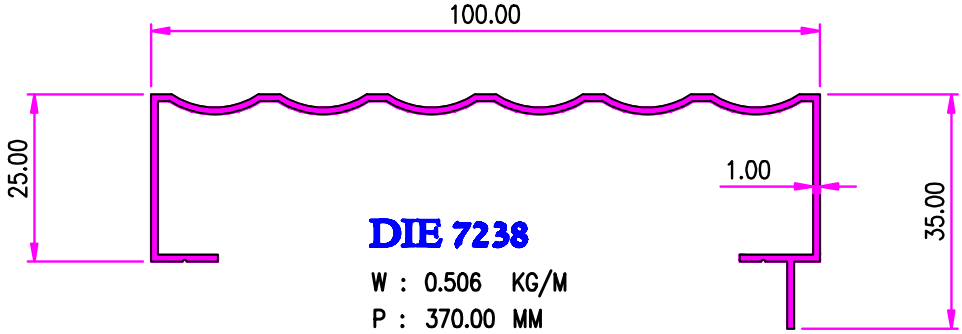
DIE 8642
W : 0.719 KG/M
P : 508.70 MM



DIE 8650
W : 0.564 KG/M
P : 425.00 MM



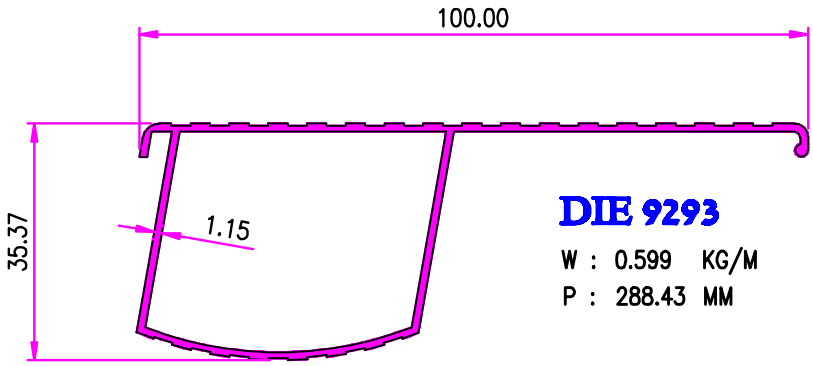
DIE 8653
W : 0.615 KG/M
P : 405.50 MM



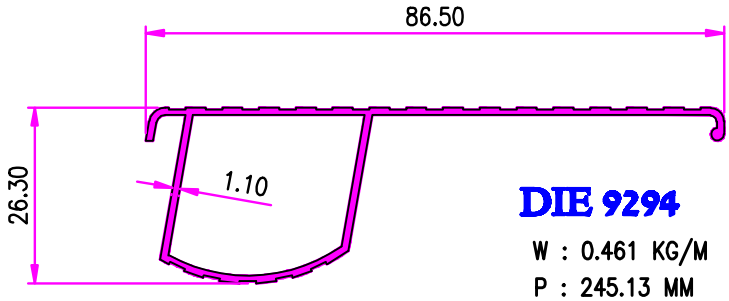
DIE 7238
W : 0.506 KG/M
P : 370.00 MM

LADDER SECTIONS

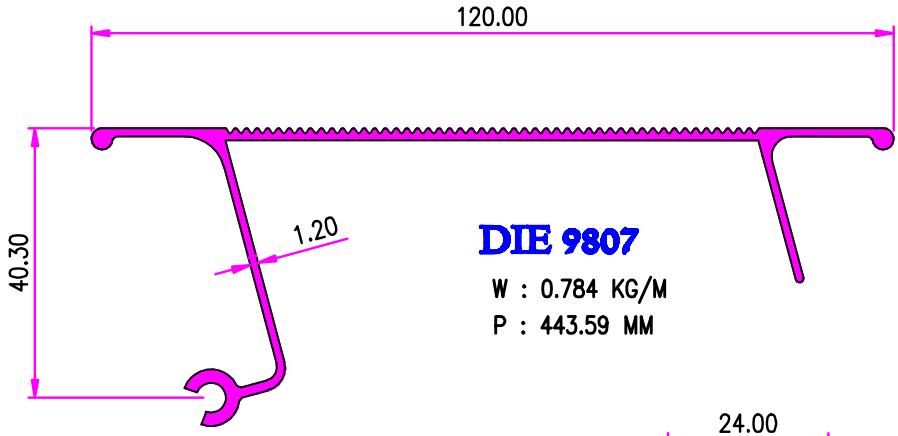
GROUP : 14C-1



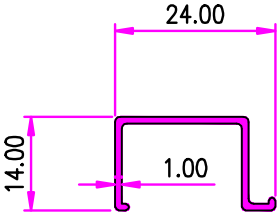
DIE 9293
W : 0.599 KG/M
P : 288.43 MM



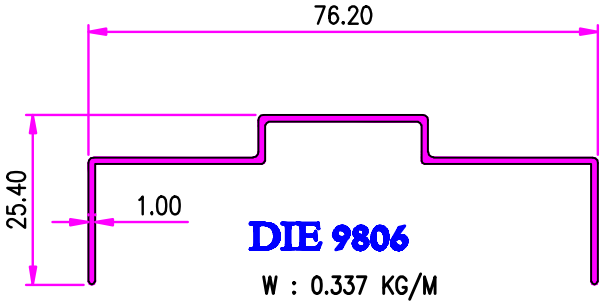
DIE 9294
W : 0.461 KG/M
P : 245.13 MM



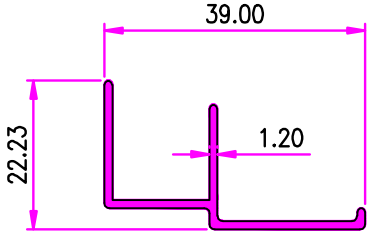
DIE 9807
W : 0.784 KG/M
P : 443.59 MM



DIE 9808
W : 0.141 KG/M
P : 103.18 MM



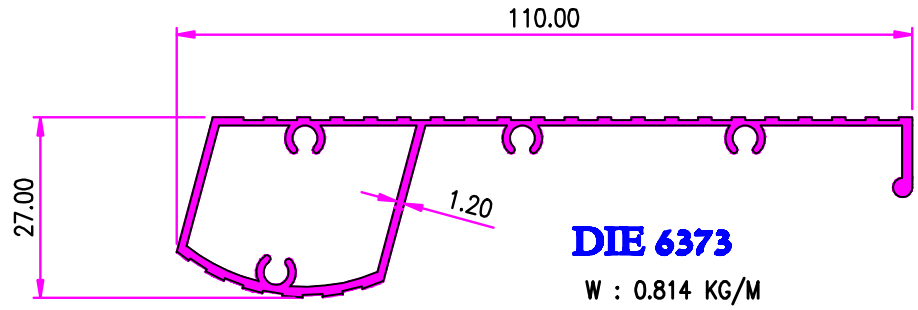
DIE 9806
W : 0.337 KG/M
P : 248.22 MM



DIE 9809
W : 0.247 KG/M
P : 151.35 MM

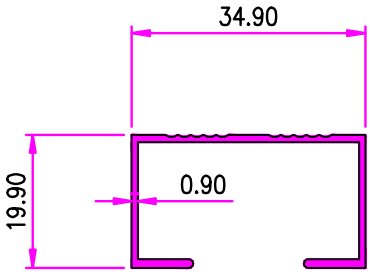
LADDER SECTIONS

GROUP : 14C-2



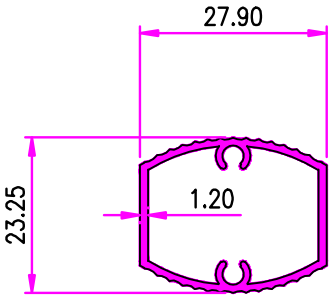
DIE 6373

W : 0.814 KG/M
P : 315.70 MM



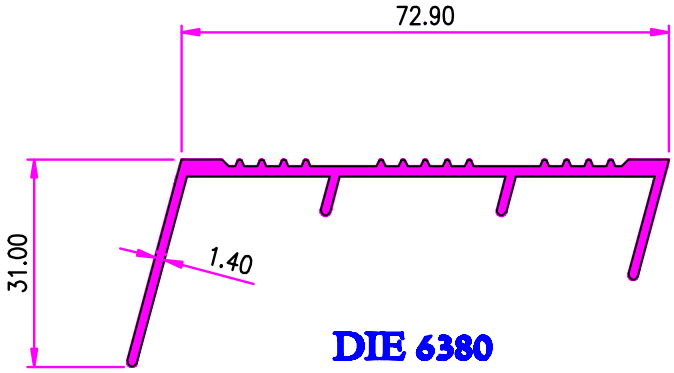
DIE 6378

W : 0.242 KG/M
P : 179.81 MM



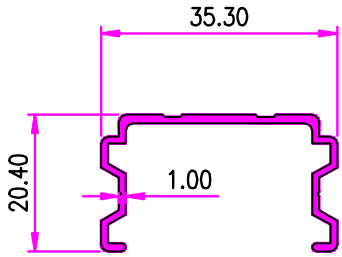
DIE 6379

W : 0.289 KG/M
P : 91.70 MM



DIE 6380

W : 0.574 KG/M
P : 279.65 MM

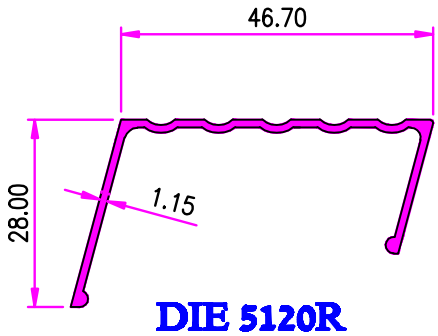


DIE 9516

W : 0.250 KG/M
P : 169.40 MM

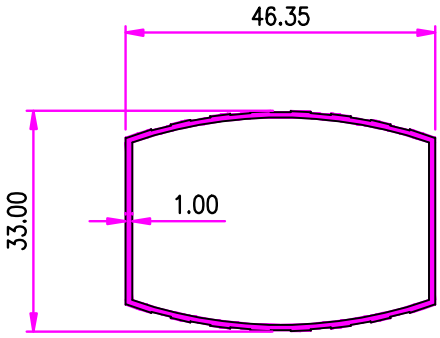
LADDER SECTIONS

GROUP : 14C-3



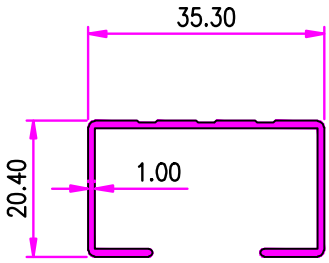
DIE 5120R

W : 0.318 KG/M
P : 192.63 MM



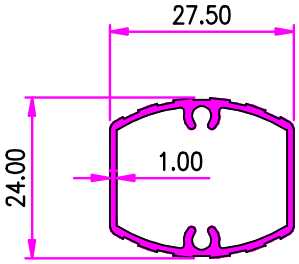
DIE 5198

W : 0.359 KG/M
P : 150.01 MM



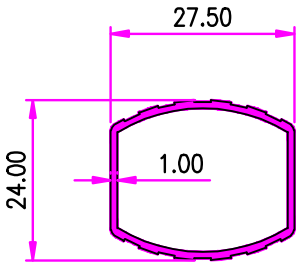
DIE 5199

W : 0.265 KG/M
P : 182.20 MM



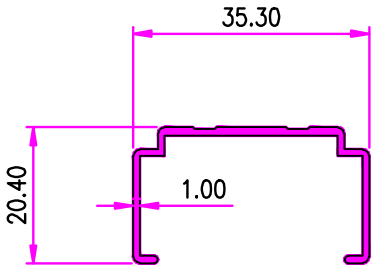
DIE 5200

W : 0.293 KG/M
P : 95.37 MM



DIE 5200R

W : 0.243 KG/M
P : 95.36 MM

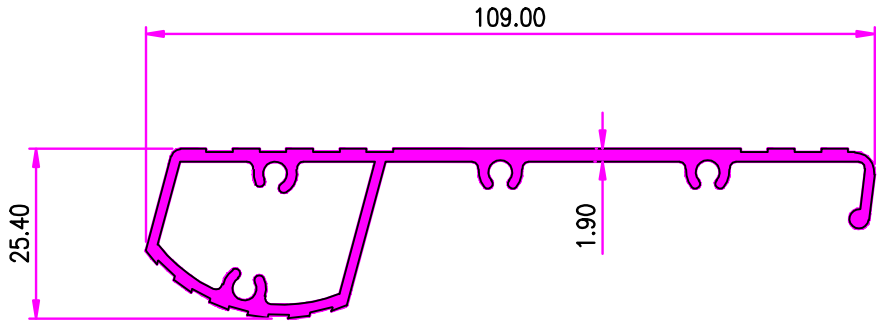


DIE 5999

W : 0.232 KG/M
P : 157.29 MM

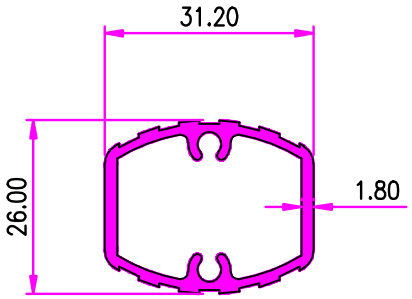
LADDER SECTIONS

GROUP : 14C-4



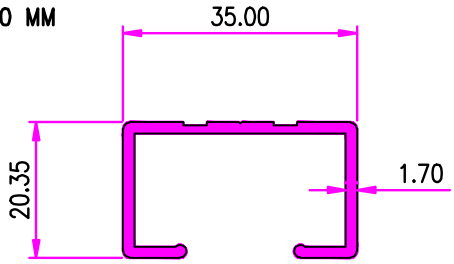
DIE 8493

W : 1.061 KG/M
P : 475.00 MM



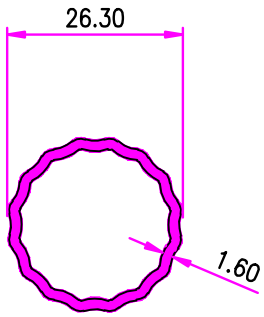
DIE 8492

W : 0.505 KG/M
P : 210.62 MM



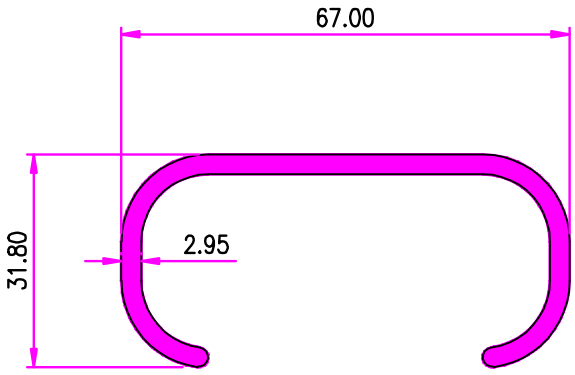
DIE 8495

W : 0.395 KG/M
P : 181.95 MM



DIE 8494

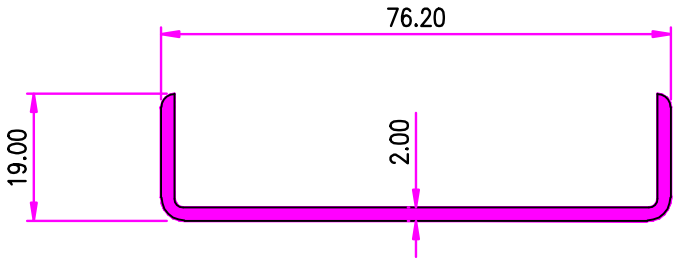
W : 0.384 KG/M
P : 176.75 MM



DIE 8491E

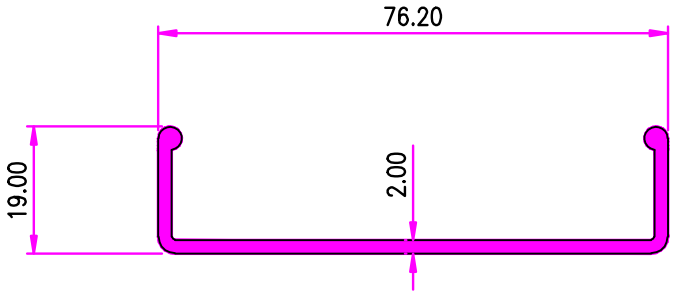
W : 0.995 KG/M
P : 259.90 MM

OTHERS **GROUP : 14D-1**



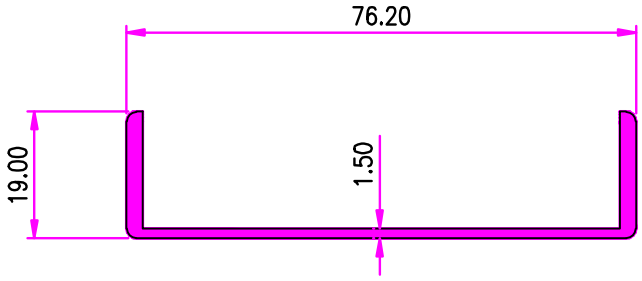
DIE 8518

W : 0.580 KG/M
P : 220.00 MM



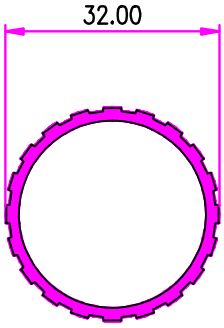
DIE 8519

W : 0.608 KG/M
P : 222.00 MM



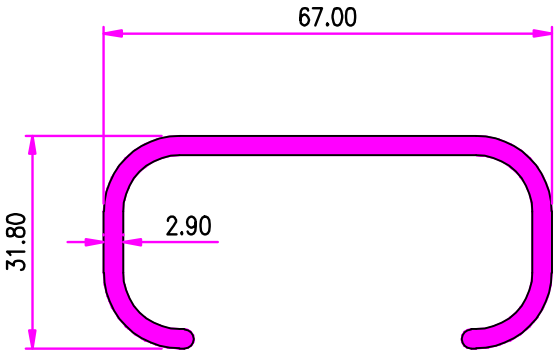
DIE 8563

W : 0.520 KG/M
P : 223.00 MM



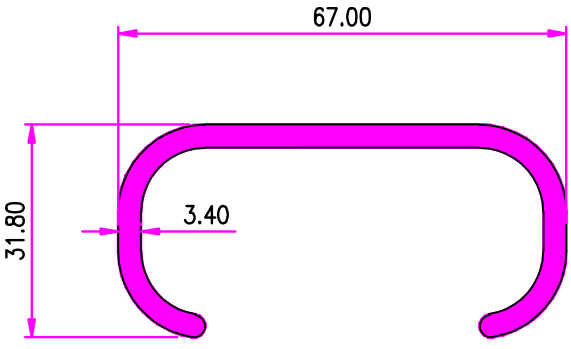
DIE 8515

W : 0.440 KG/M
P : 208.00 MM



DIE 8516

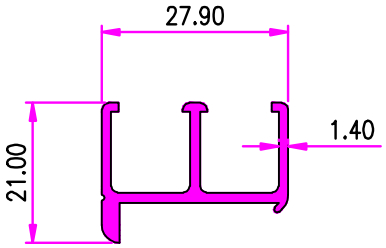
W : 1.010 KG/M
P : 261.49 MM



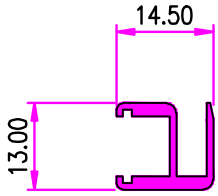
DIE 8517

W : 1.140 KG/M
P : 280.00 MM

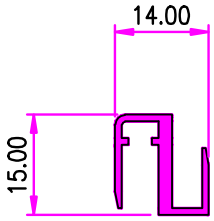
TRANSPORT (CARROSERIE) SECTIONS — GROUP : 15A-1



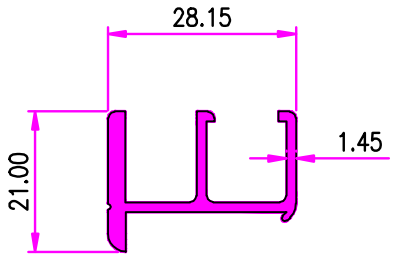
DIE 8761
W : 0.331 KG/M
P : 160.57 MM



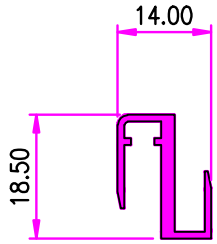
DIE 8774
W : 0.183 KG/M
P : 97.00 MM



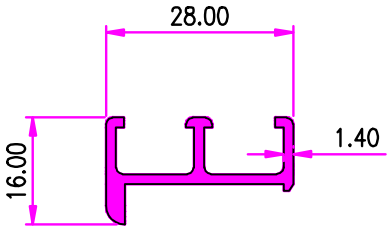
DIE 8775
W : 0.193 KG/M
P : 105.00 MM



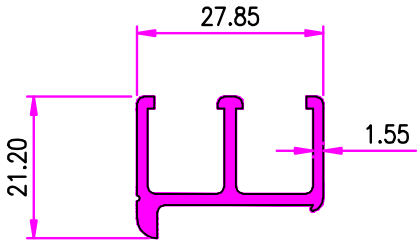
DIE 8777
W : 0.361 KG/M
P : 162.30 MM



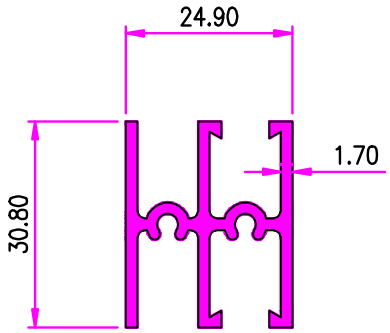
DIE 8785
W : 0.121 KG/M
P : 112.00 MM



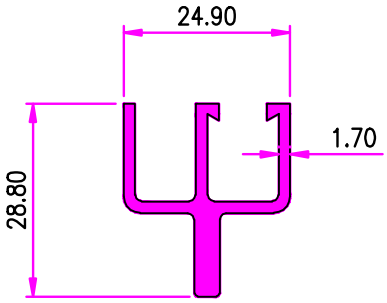
DIE 8776
W : 0.265 KG/M
P : 135.90 MM



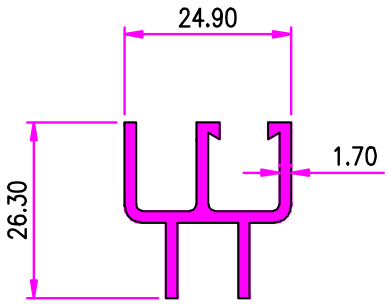
DIE 8794
W : 0.366 KG/M
P : 156.41 MM



DIE 8781
W : 0.634 KG/M
P : 268.40 MM

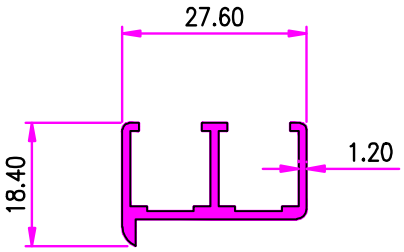


DIE 8783
W : 0.468 KG/M
P : 172.38 MM

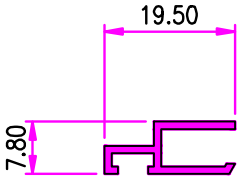


DIE 8782
W : 0.410 KG/M
P : 182.31 MM

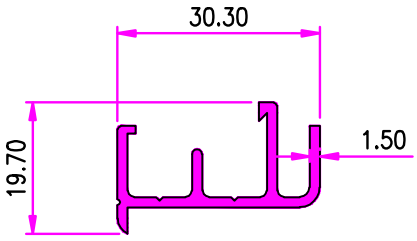
TRANSPORT (CARROSERIE) SECTIONS — GROUP : 15A-2



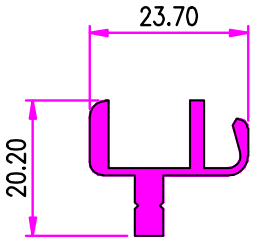
DIE 8662
W : 0.267 KG/M
P : 151.71 MM



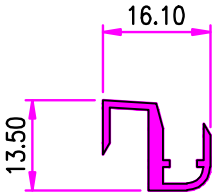
DIE 8664
W : 0.148 KG/M
P : 91.50 MM



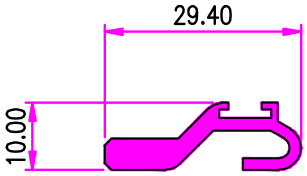
DIE 8670
W : 0.314 KG/M
P : 162.00 MM



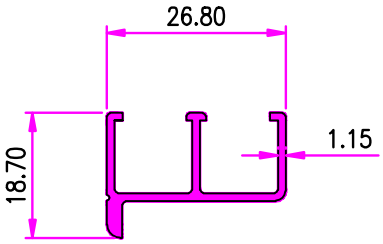
DIE 8795
W : 0.335 KG/M
P : 125.00 MM



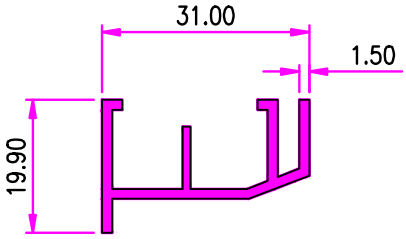
DIE 8796
W : 0.149 KG/M
P : 92.80 MM



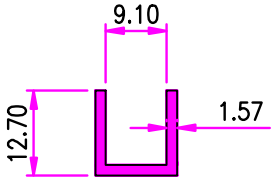
DIE 8797
W : 0.336 KG/M
P : 103.55 MM



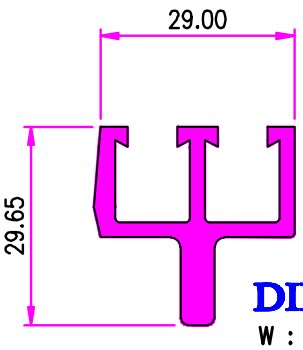
DIE 8432
W : 0.240 KG/M
P : 148.00 MM



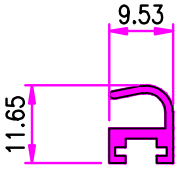
DIE 8414
W : 0.350 KG/M
P : 178.00 MM



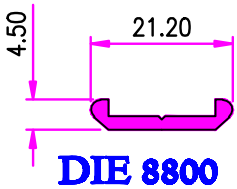
DIE 8760
W : 0.149 KG/M
P : 72.60 MM



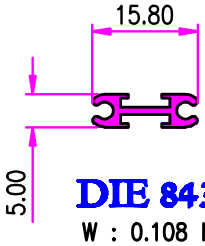
DIE 8413
W : 0.690 KG/M
P : 196.50 MM



DIE 8799
W : 0.126 KG/M
P : 72.50 MM



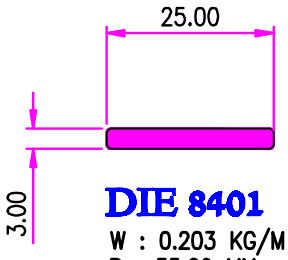
DIE 8800
W : 0.132 KG/M
P : 53.00 MM



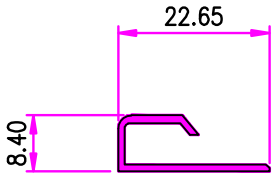
DIE 8433
W : 0.108 KG/M
P : 63.00 MM

TRANSPORT (CARROSERIE) SECTIONS

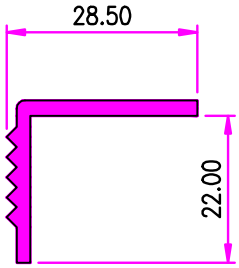
GROUP : 15A-3



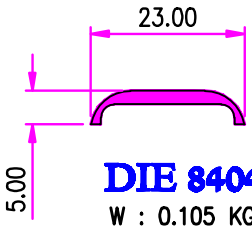
DIE 8401
W : 0.203 KG/M
P : 55.20 MM



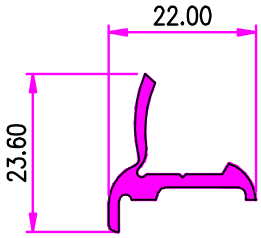
DIE 8402
W : 0.117 KG/M
P : 83.50 MM



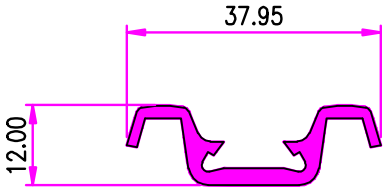
DIE 8403
W : 0.319 KG/M
P : 103.00 MM



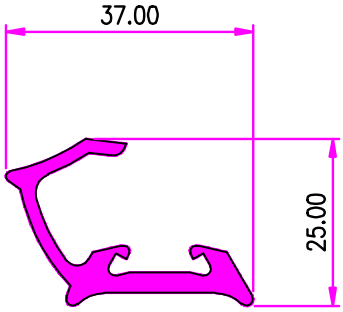
DIE 8404
W : 0.105 KG/M
P : 54.60 MM



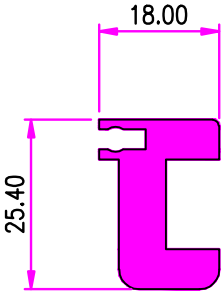
DIE 8405
W : 0.271 KG/M
P : 95.00 MM



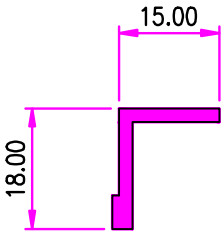
DIE 8410
W : 0.376 KG/M
P : 142.24 MM



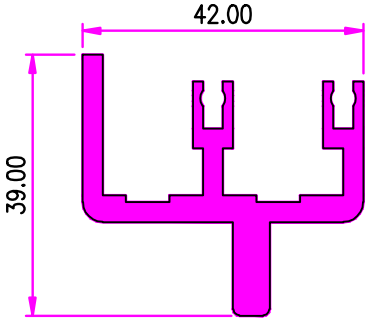
DIE 8406
W : 0.519 KG/M
P : 155.16 MM



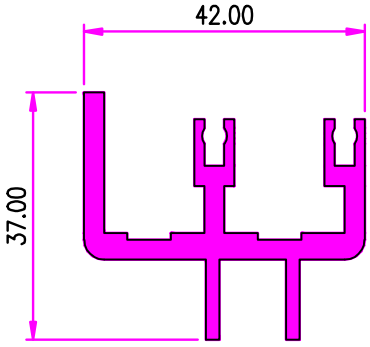
DIE 8407
W : 0.724 KG/M
P : 114.50 MM



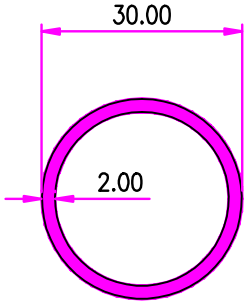
DIE 8411
W : 0.182 KG/M
P : 68.00 MM



DIE 8408
W : 1.108 KG/M
P : 271.00 MM

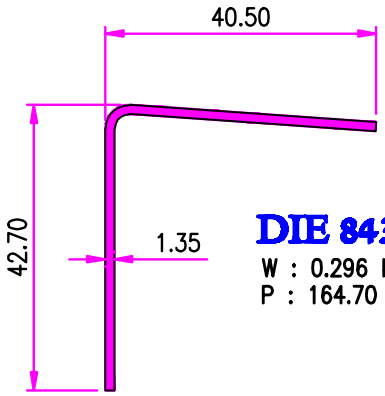


DIE 8409
W : 1.030 KG/M
P : 292.00 MM

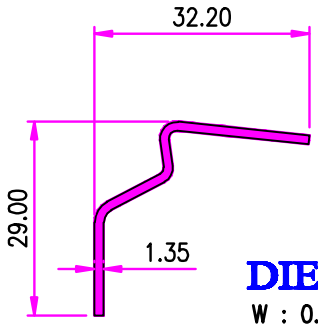


DIE 8412
W : 0.477 KG/M
P : 94.25 MM

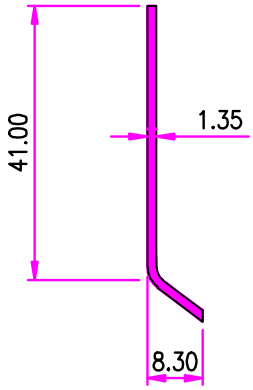
TRANSPORT (CARROSERIE) SECTIONS — GROUP : 15A-4



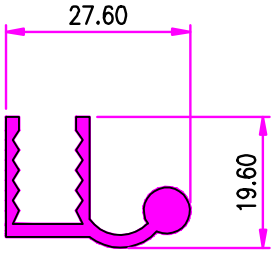
DIE 8435
W : 0.296 KG/M
P : 164.70 MM



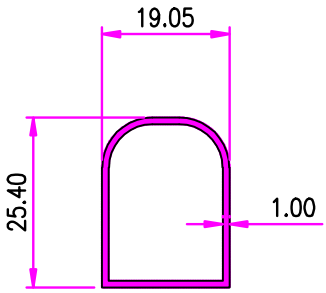
DIE 8436
W : 0.210 KG/M
P : 117.70 MM



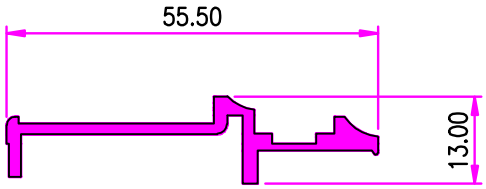
DIE 8434
W : 0.188 KG/M
P : 105.30 MM



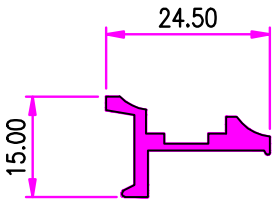
DIE 8437
W : 0.370 KG/M
P : 141.20 MM



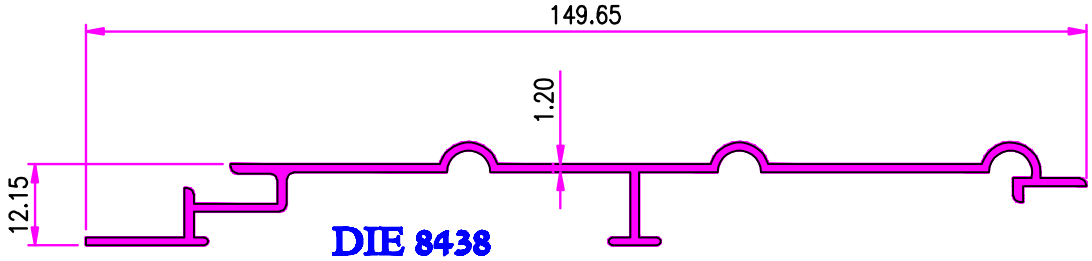
DIE 8439
W : 0.214 KG/M
P : 159.78 MM



DIE 8384
W : 0.430 KG/M
P : 162.00 MM



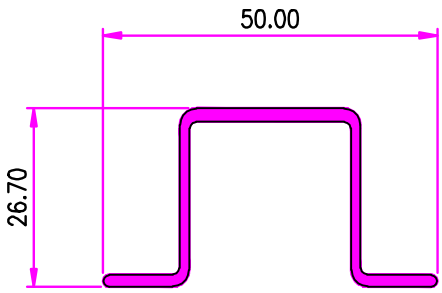
DIE 8385
W : 0.231 KG/M
P : 92.00 MM



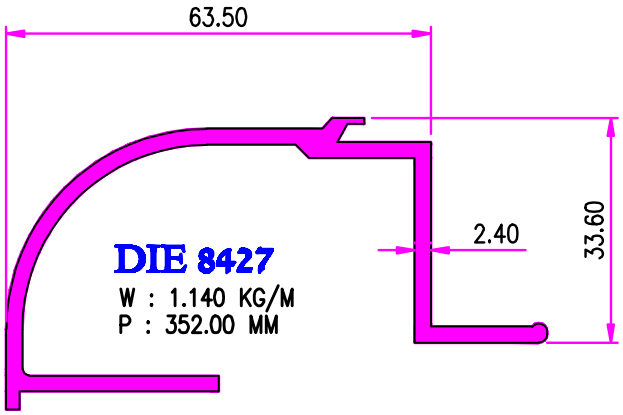
DIE 8438
W : 0.748 KG/M
P : 430.30 MM

TRANSPORT (CARROSERIE) SECTIONS

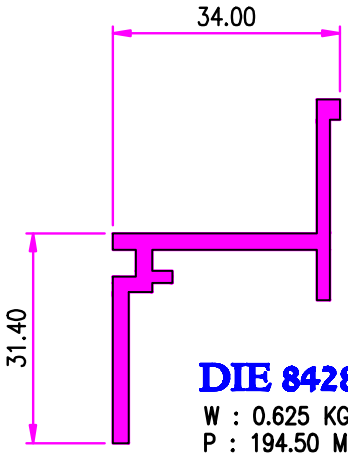
GROUP : 15A-5



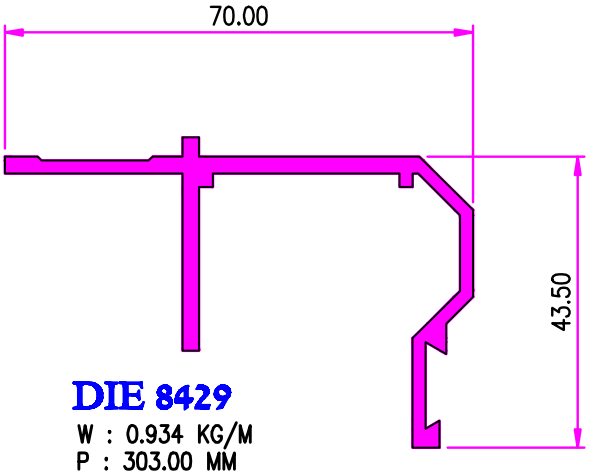
DIE 8426
W : 0.455 KG/M
P : 205.60 MM



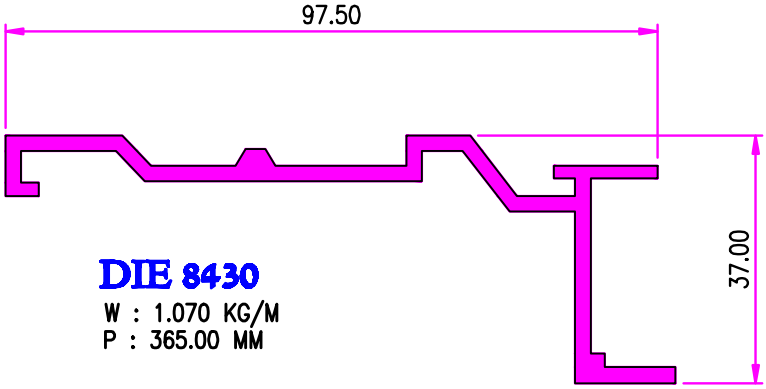
DIE 8427
W : 1.140 KG/M
P : 352.00 MM



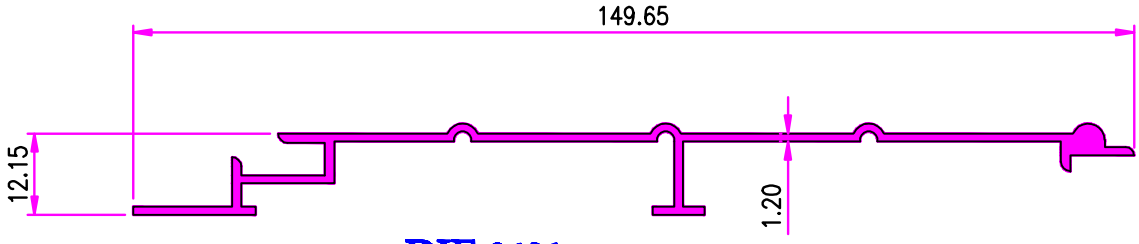
DIE 8428
W : 0.625 KG/M
P : 194.50 MM



DIE 8429
W : 0.934 KG/M
P : 303.00 MM



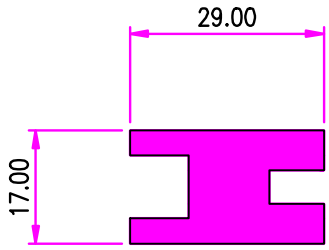
DIE 8430
W : 1.070 KG/M
P : 365.00 MM



DIE 8431
W : 0.730 KG/M
P : 410.00 MM

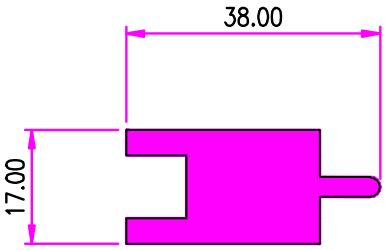
TRANSPORT (CARROSERIE) SECTIONS

GROUP : 15A-6



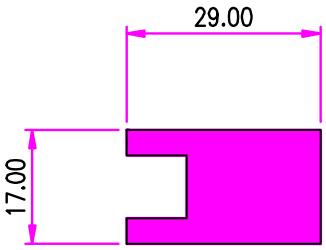
DIE 8538

W : 1.001 KG/M
P : 126.00 MM



DIE 8555

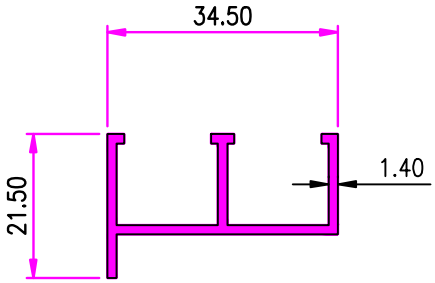
W : 1.172 KG/M
P : 128.00 MM



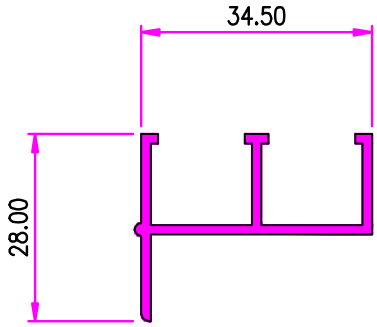
DIE 8554

W : 1.107 KG/M
P : 110.00 MM

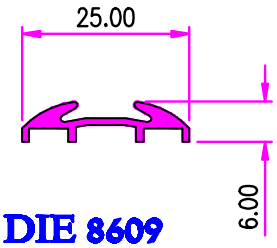
TRANSPORT (CARROSERIE) SECTIONS — GROUP : 15A-7



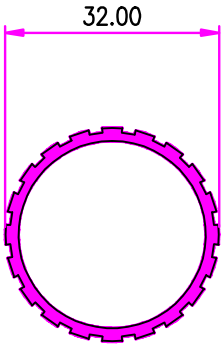
DIE 8556
W : 0.330 KG/M
P : 265.00 MM



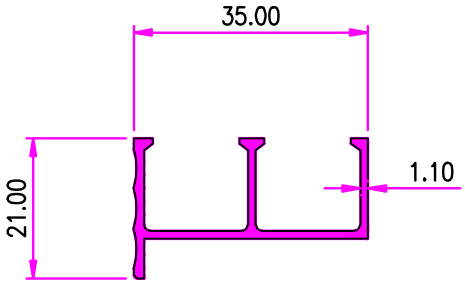
DIE 8624
W : 0.356 KG/M
P : 189.00 MM



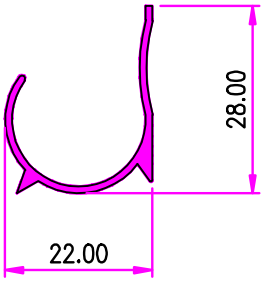
DIE 8609
W : 0.160 KG/M
P : 70.00 MM



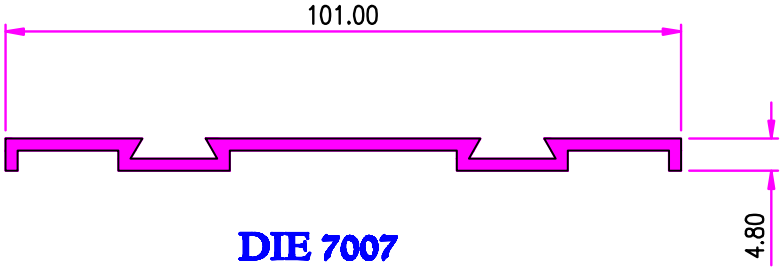
DIE 8515
W : 0.440 KG/M
P : 208.00 MM



DIE 7108
W : 0.275 KG/M
P : 178.20 MM



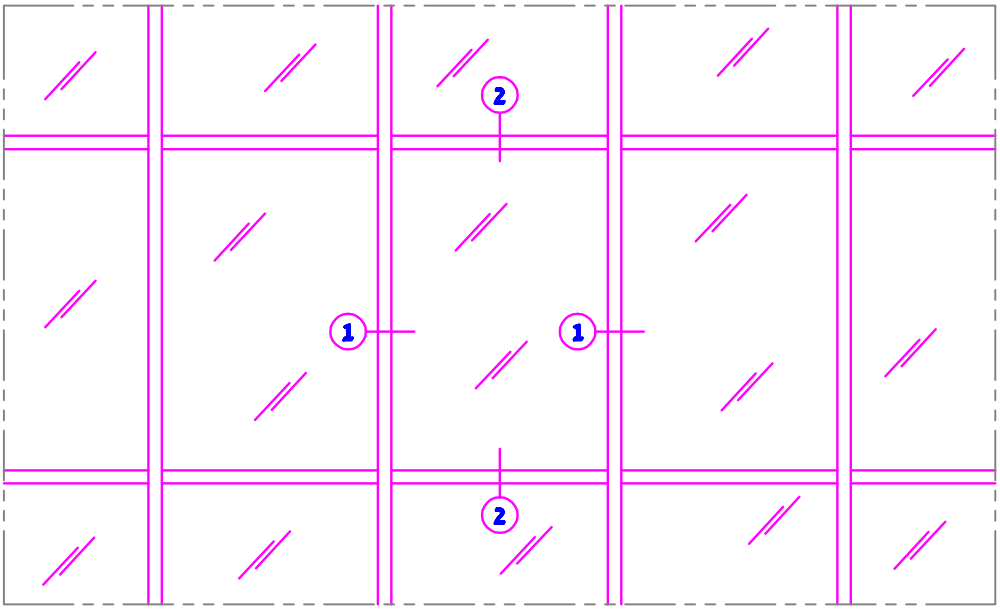
DIE 8606
W : 0.190 KG/M
P : 196.00 MM

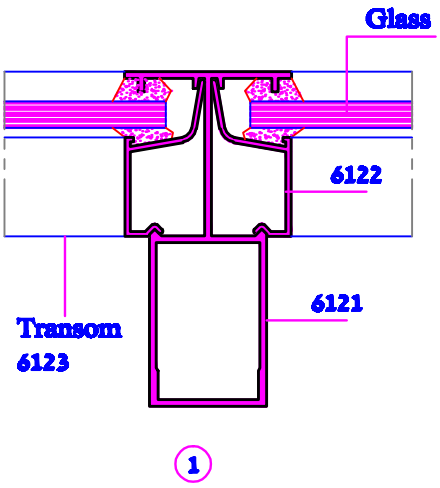


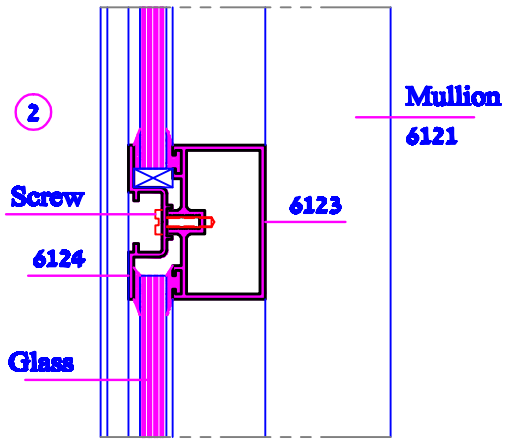
DIE 7007
W : 0.640 KG/M
P : 251.00 MM

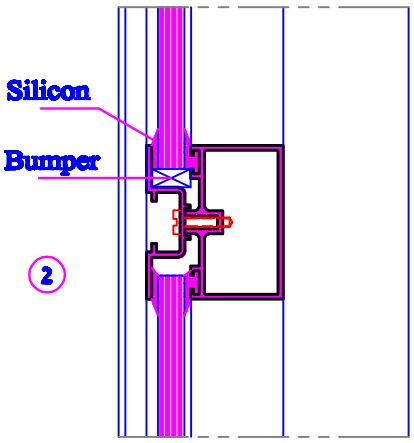
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

LIGHT DUTY CURTAIN WALL ASSEMBLY DETAIL — GROUP : 16A-1

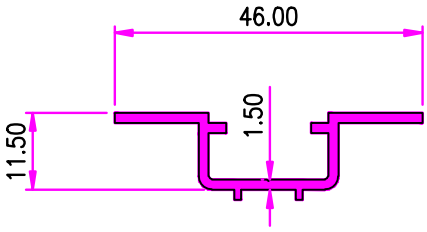






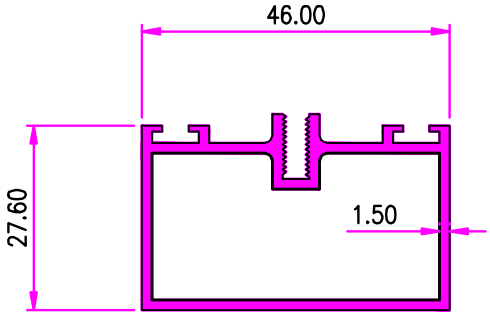


LIGHT DUTY CURTAIN WALL SECTIONS — GROUP : 16B-1



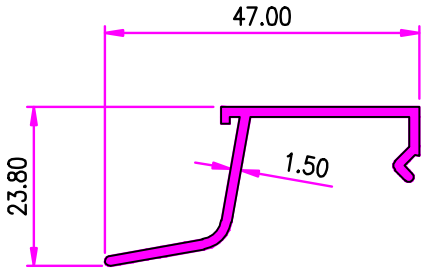
DIE 6124

W : 0.297 KG/M
P : 151.40 MM



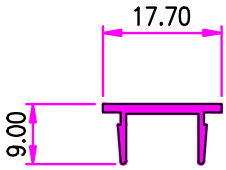
DIE 6123

W : 0.728 KG/M
P : 369.00 MM



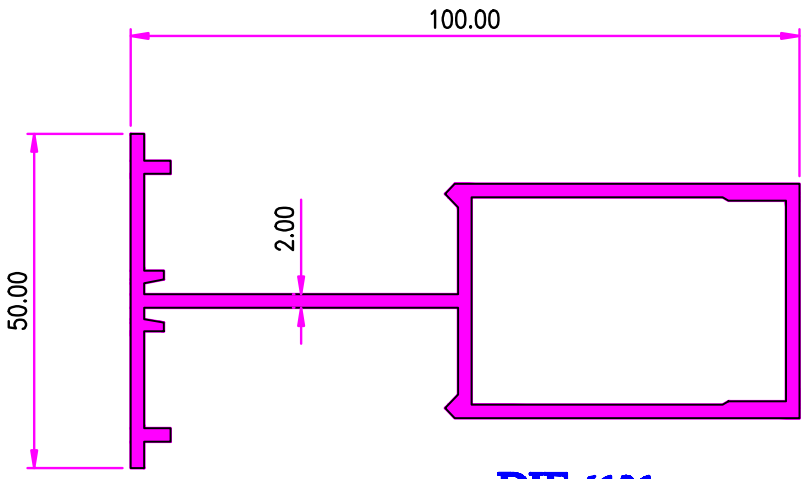
DIE 6122

W : 0.320 KG/M
P : 157.50 MM



DIE 11540

W : 0.124 KG/M
P : 69.69 MM

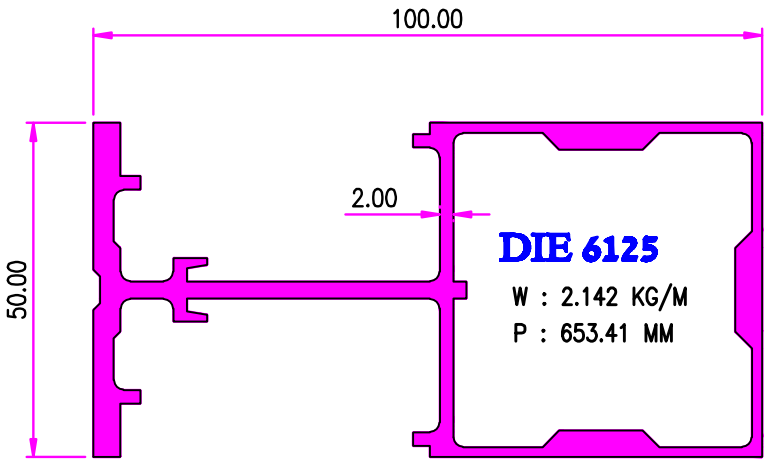


DIE 6121

W : 1.548 KG/M
P : 554.00 MM

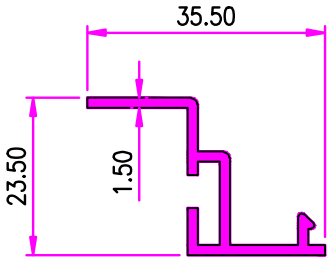
MEDIUM DUTY CURTAIN WALL SECTIONS

GROUP : 16C-1



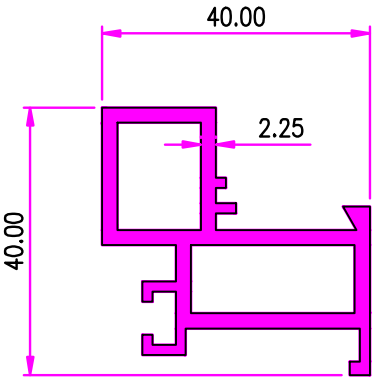
DIE 6125

W : 2.142 KG/M
P : 653.41 MM



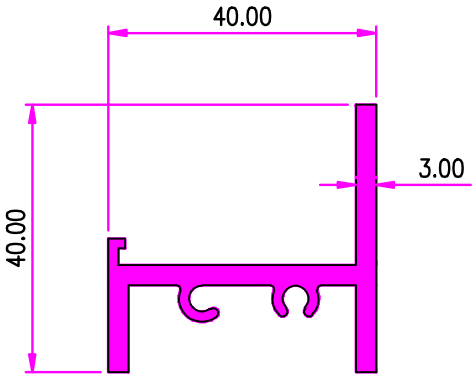
DIE 6126

W : 0.285 KG/M
P : 152.00 MM



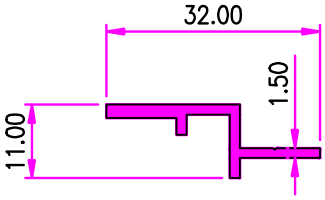
DIE 6127

W : 1.024 KG/M
P : 351.61 MM



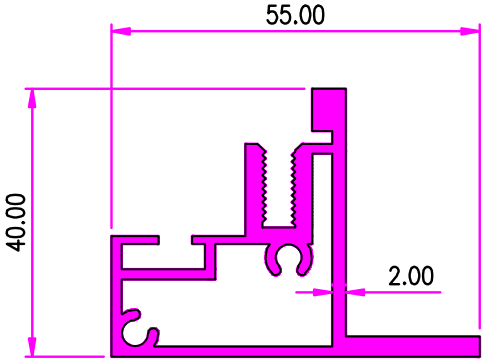
DIE 6128

W : 0.840 KG/M
P : 234.50 MM



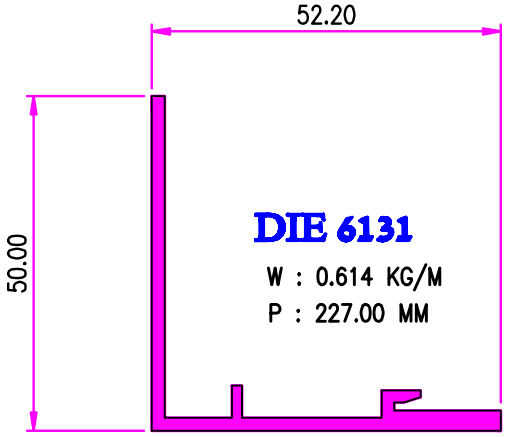
DIE 6130

W : 0.195 KG/M
P : 92.21 MM



DIE 6129

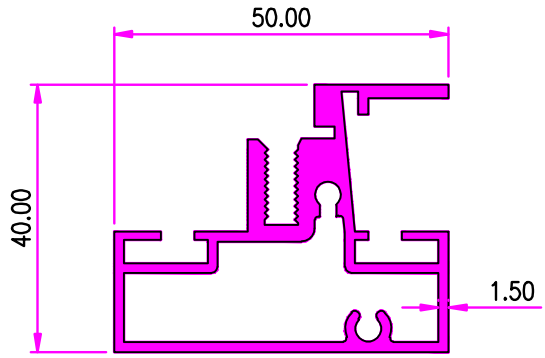
W : 1.077 KG/M
P : 403.25 MM



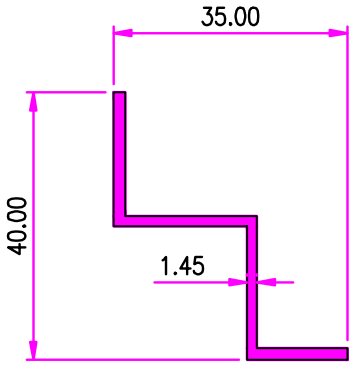
DIE 6131

W : 0.614 KG/M
P : 227.00 MM

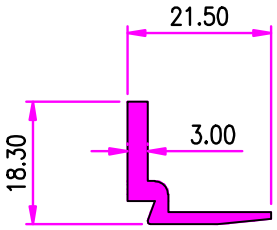
MEDIUM DUTY CURTAIN WALL SECTIONS — GROUP : 16C-2



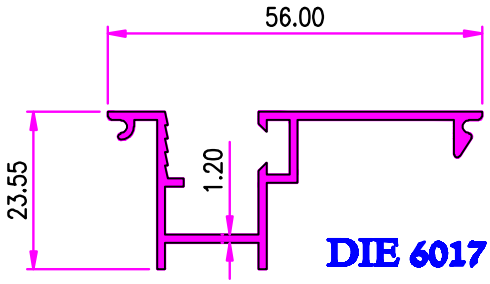
DIE 6132
W : 1.138 KG/M
P : 304.67 MM



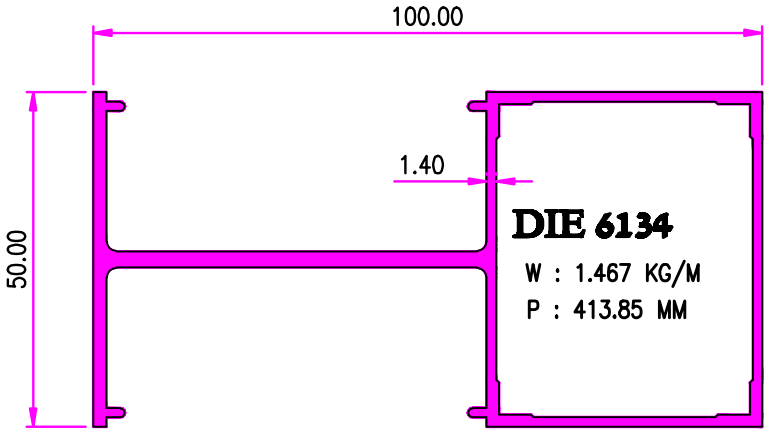
DIE 8812
W : 0.315 KG/M
P : 151.50 MM



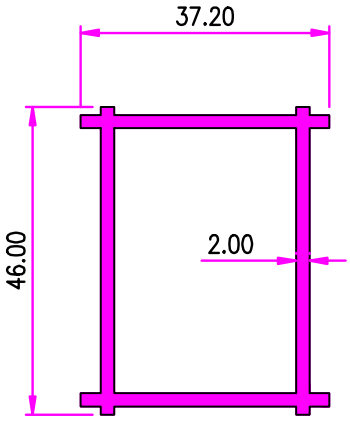
DIE 6133
W : 0.237 KG/M
P : 79.80 MM



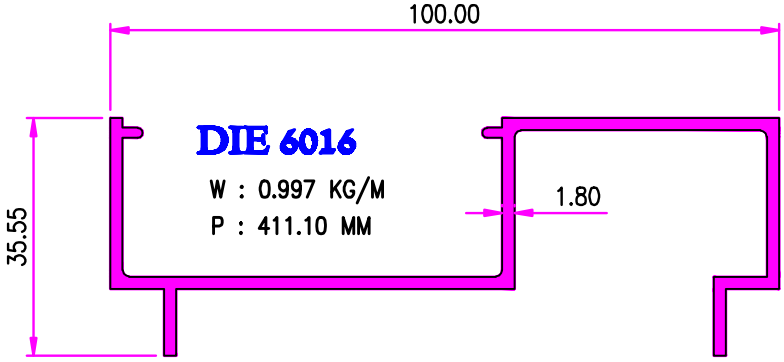
DIE 6017
W : 0.407 KG/M
P : 245.13 MM



DIE 6134
W : 1.467 KG/M
P : 413.85 MM



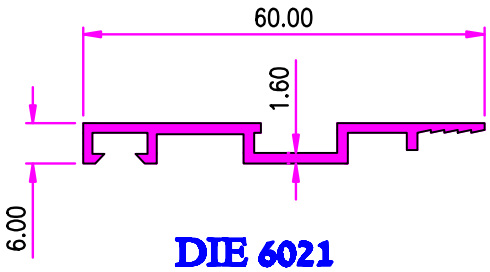
DIE 6015
W : 0.859 KG/M
P : 182.40 MM



DIE 6016
W : 0.997 KG/M
P : 411.10 MM

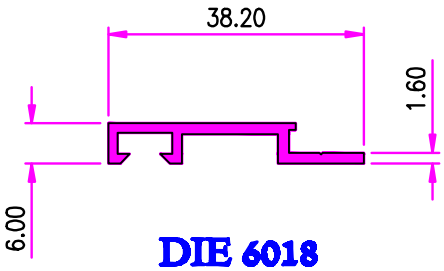
MEDIUM DUTY CURTAIN WALL SECTIONS

GROUP : 16C-3



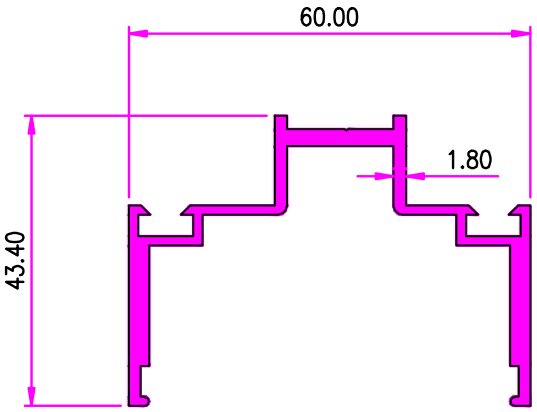
DIE 6021

W : 0.349 KG/M
P : 176.60 MM



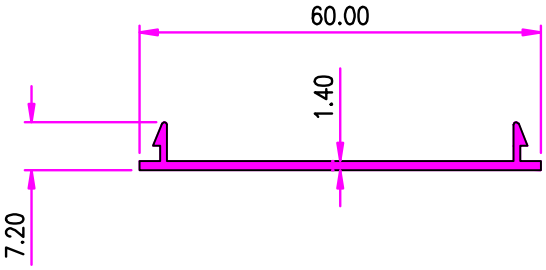
DIE 6018

W : 0.226 KG/M
P : 174.99 MM



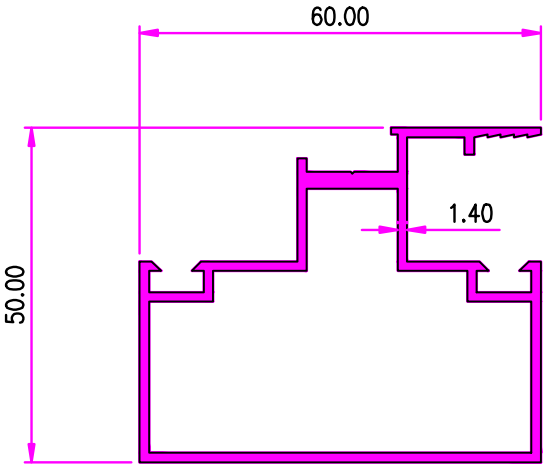
DIE 6019

W : 0.871 KG/M
P : 323.45 MM



DIE 6020

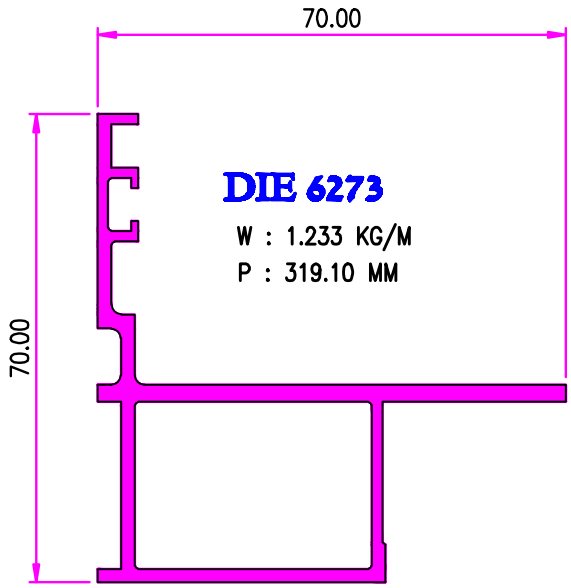
W : 0.274 KG/M
P : 148.33 MM



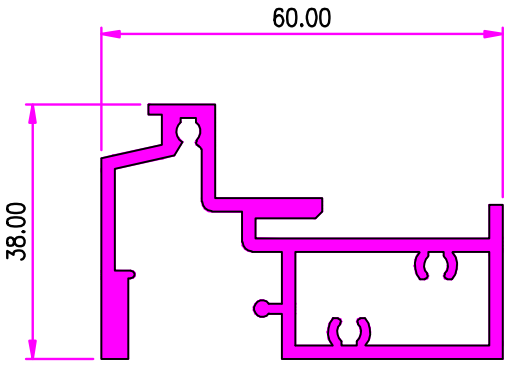
DIE 6022

W : 0.970 KG/M
P : 302.79 MM

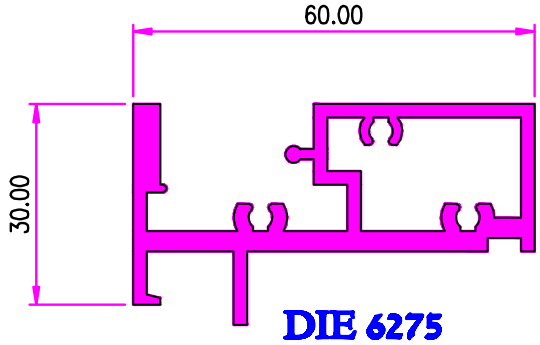
MEDIUM DUTY CURTAIN WALL SECTIONS — GROUP : 16C-4



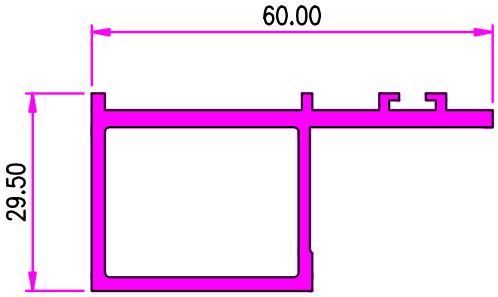
DIE 6273
W : 1.233 KG/M
P : 319.10 MM



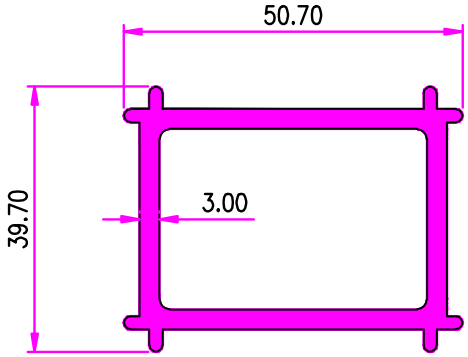
DIE 6274
W : 1.236 KG/M
P : 306.30 MM



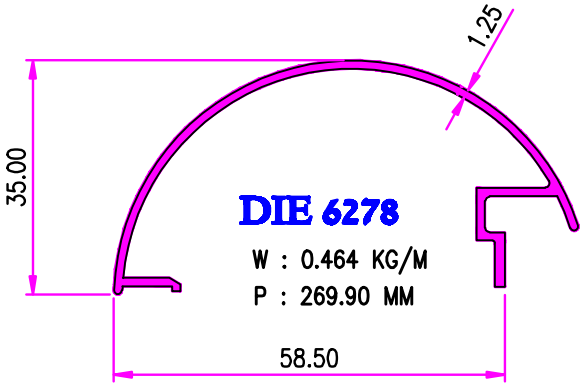
DIE 6275
W : 1.319 KG/M
P : 283.20 MM



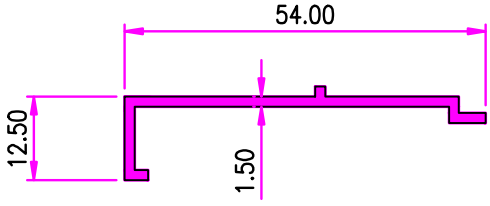
DIE 6276
W : 0.859 KG/M
P : 197.50 MM



DIE 6277
W : 1.306 KG/M
P : 196.73 MM



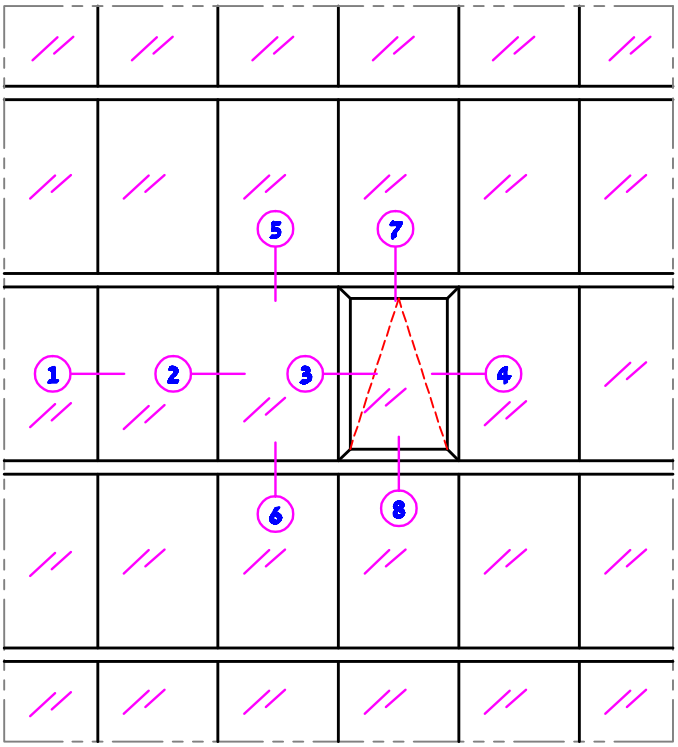
DIE 6278
W : 0.464 KG/M
P : 269.90 MM

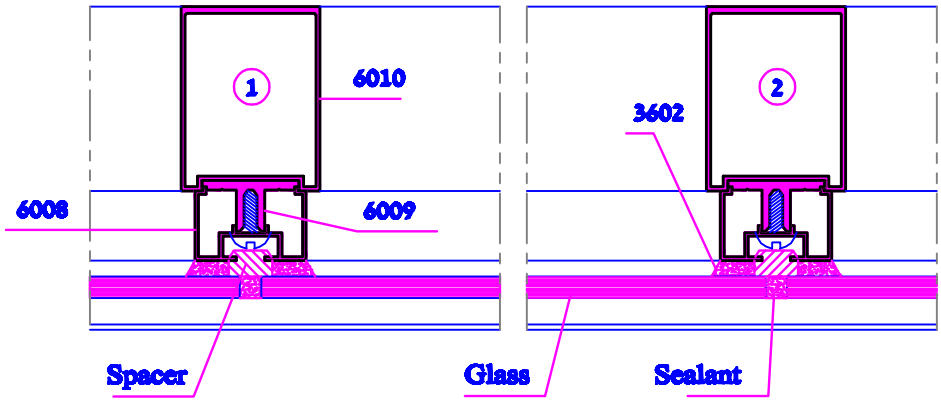


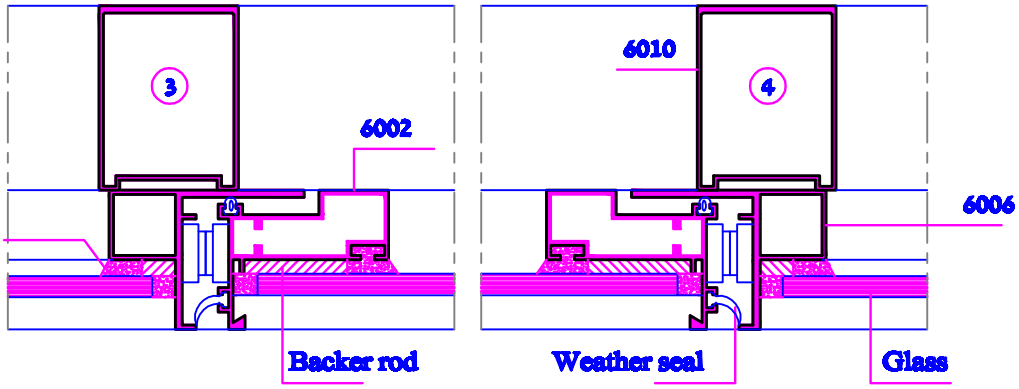
DIE 6279
W : 0.289 KG/M
P : 145.20 MM

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BACK MULLION CURTAIN WALL ASSEMBLY DETAIL GROUP : 16D-1

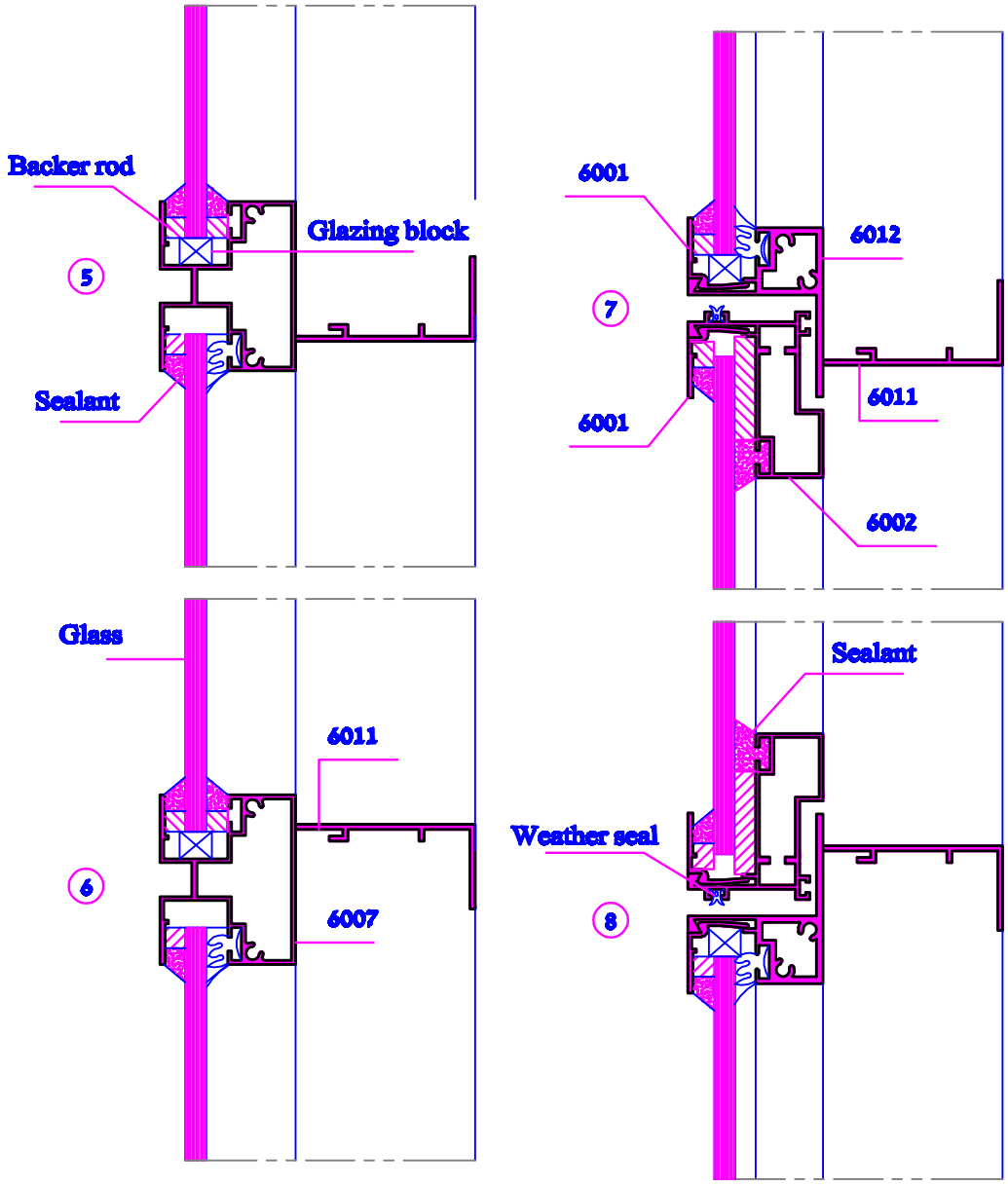




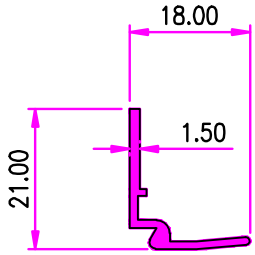


BACK MULLION CURTAIN WALL ASSEMBLY

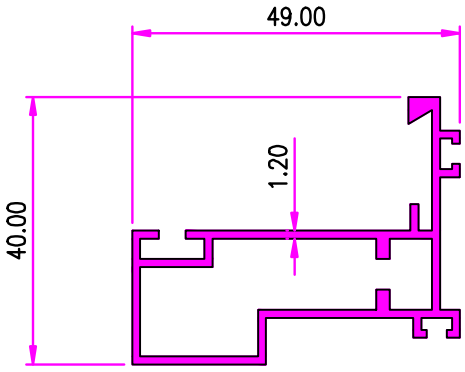
GROUP : 16D-2



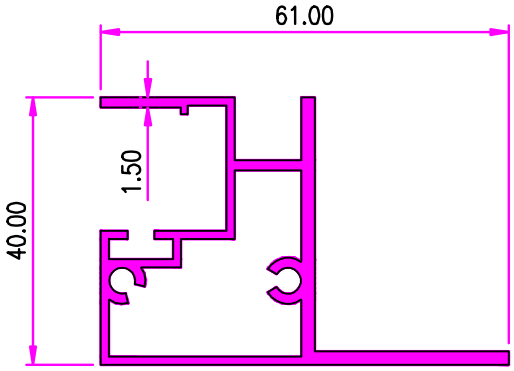
BACK MULLION CURTAIN WALL SECTIONS — GROUP : 16E-1



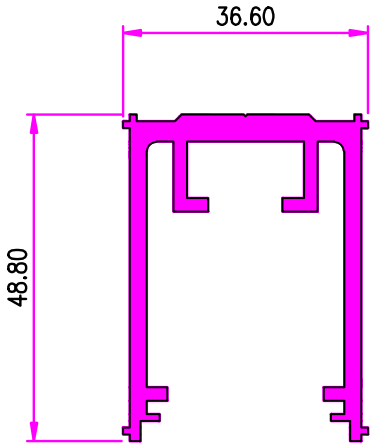
DIE 6001
W : 0.143 KG/M
P : 83.00 MM



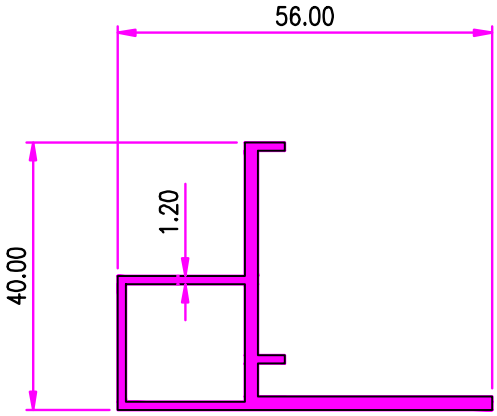
DIE 6002
W : 0.639 KG/M
P : 247.00 MM



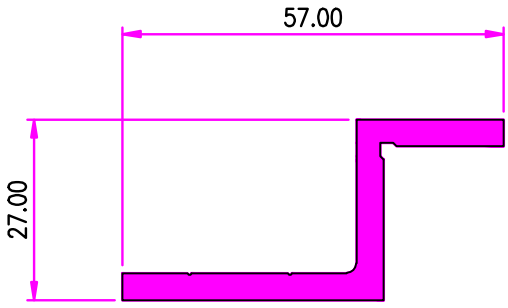
DIE 6003
W : 0.874 KG/M
P : 280.00 MM



DIE 6004
W : 1.138 KG/M
P : 332.00 MM

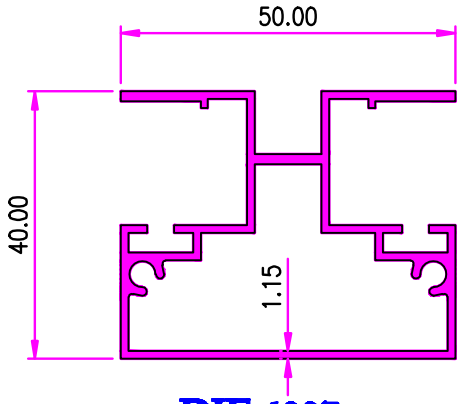


DIE 6006
W : 0.611 KG/M
P : 208.00 MM

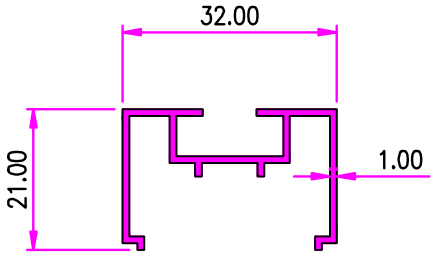


DIE 6005
W : 0.857 KG/M
P : 160.00 MM

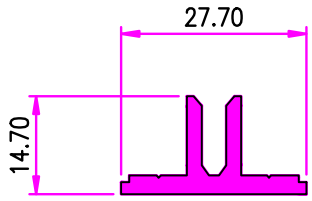
BACK MULLION CURTAIN WALL SECTIONS — GROUP : 16E-2



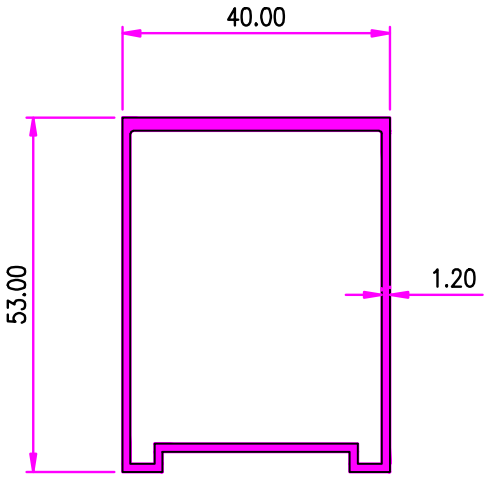
DIE 6007
W : 0.844 KG/M
P : 332.00 MM



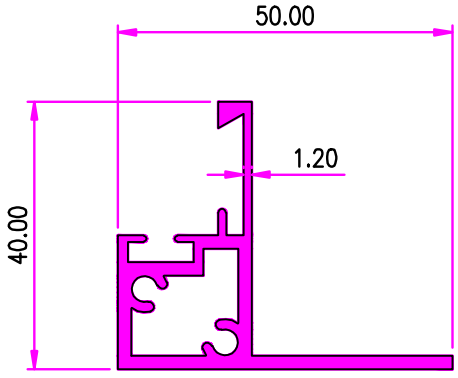
DIE 6008
W : 0.276 KG/M
P : 206.00 MM



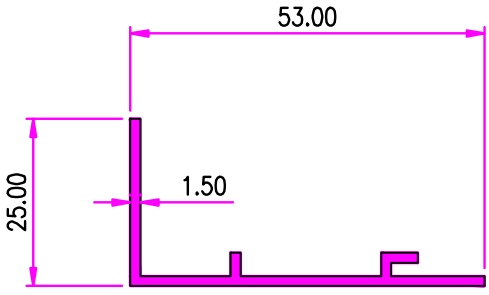
DIE 6009
W : 0.357 KG/M
P : 107.00 MM



DIE 6010
W : 0.690 KG/M
P : 192.00 MM



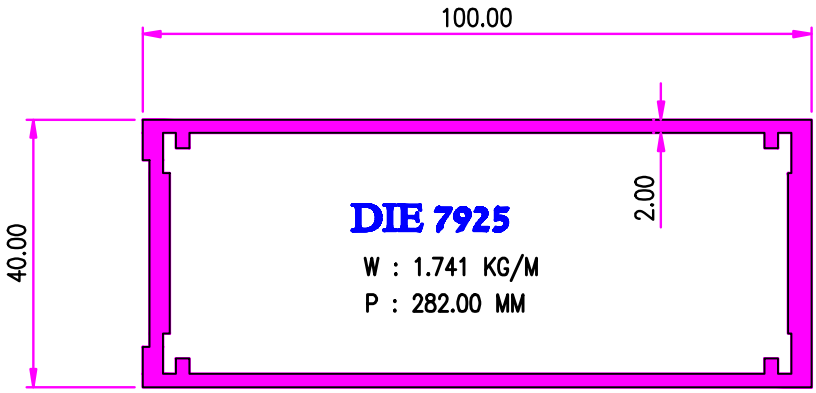
DIE 6012
W : 0.744 KG/M
P : 187.00 MM

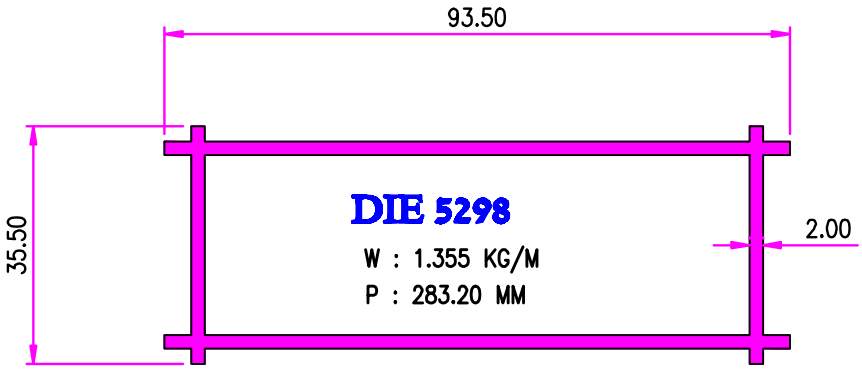


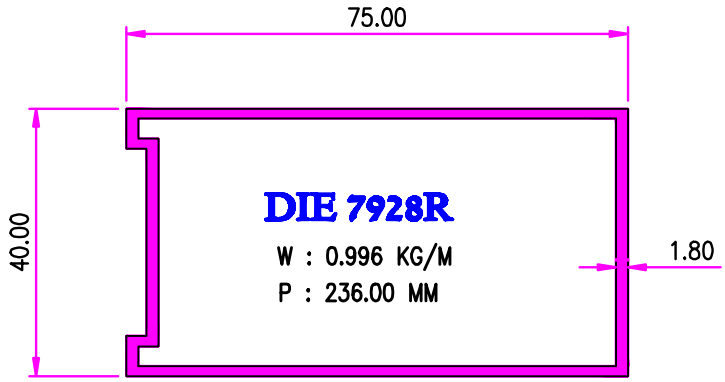
DIE 6011
W : 0.354 KG/M
P : 178.00 MM

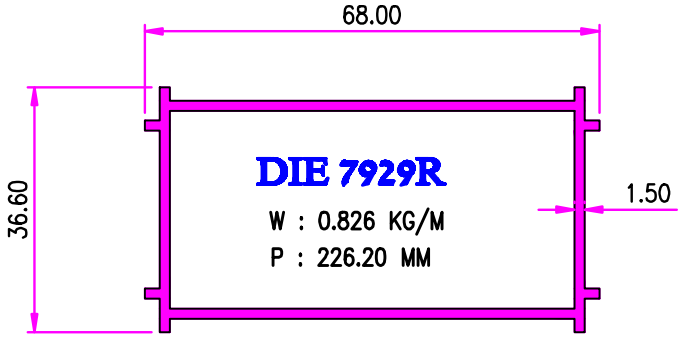
BACK MULLION CURTAIN WALL SECTIONS

GROUP : 16E-3



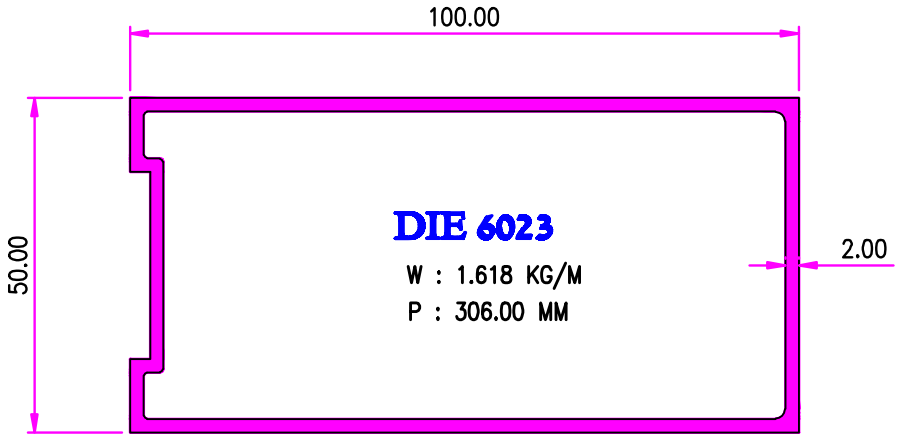


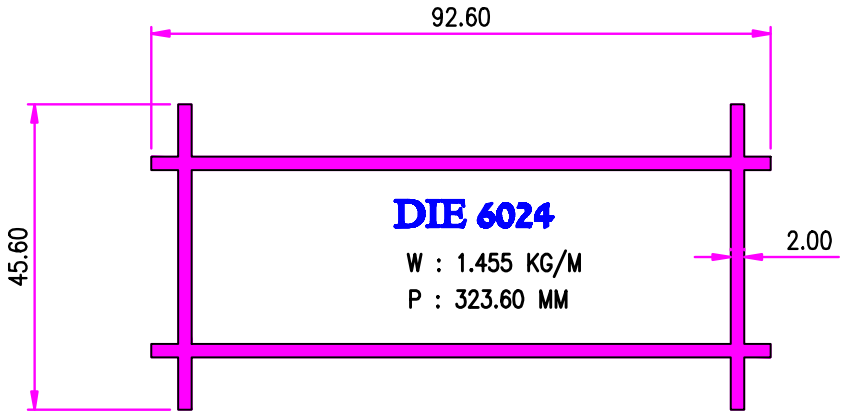


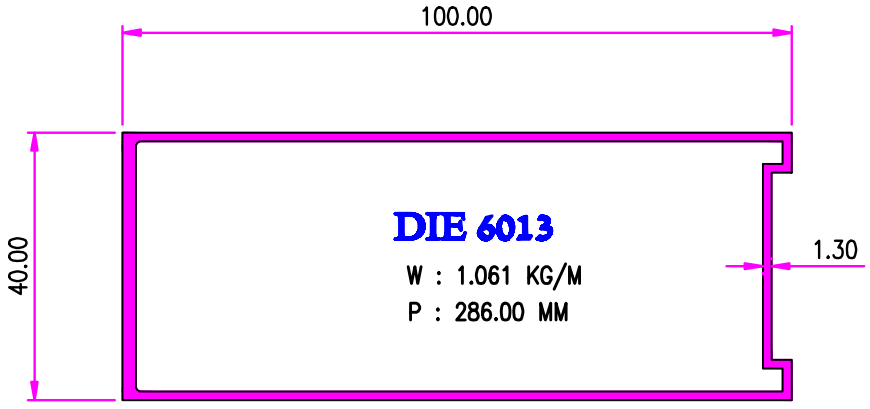


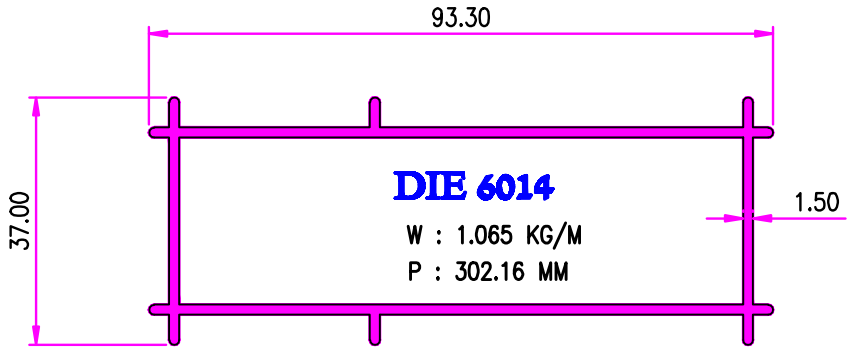
PT.ALEXINDO
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BACK MULLION CURTAIN WALL SECTIONS — GROUP : 16E-4



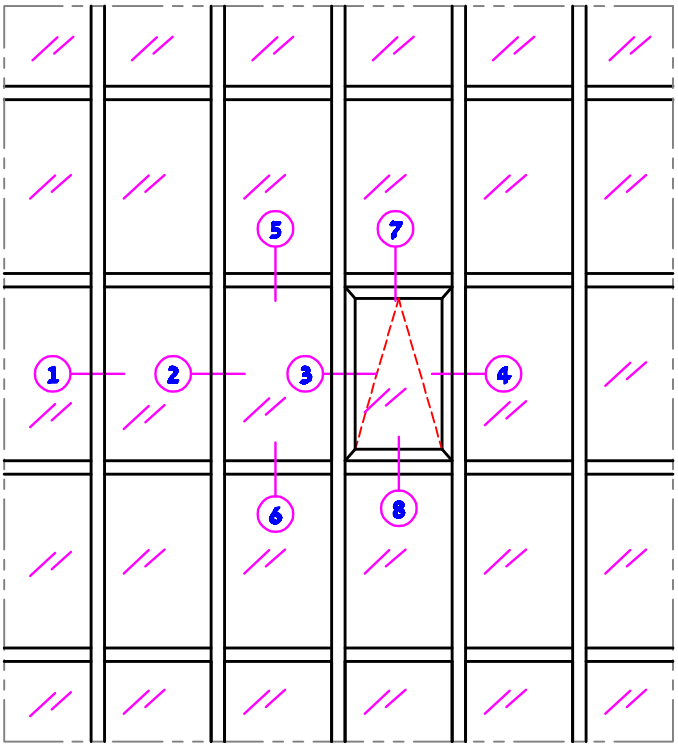


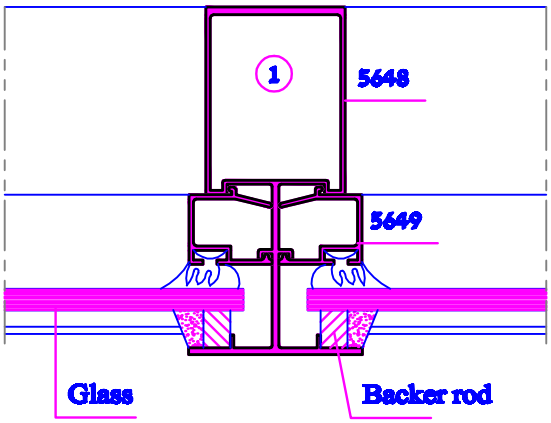


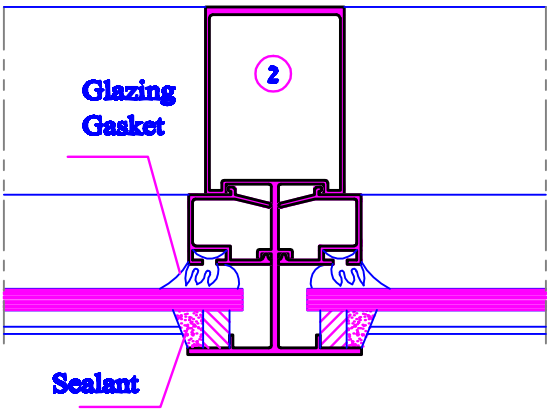


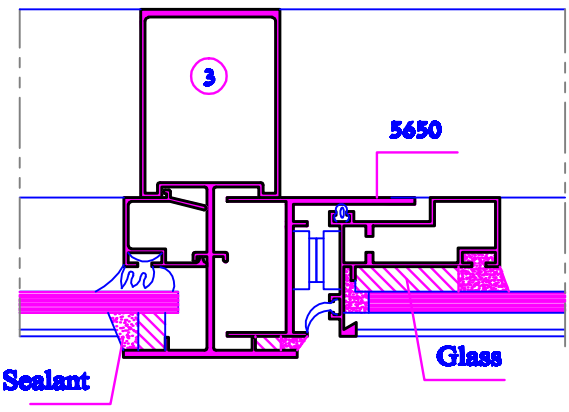
ECONOMY CURTAIN WALL ASSEMBLY DETAIL

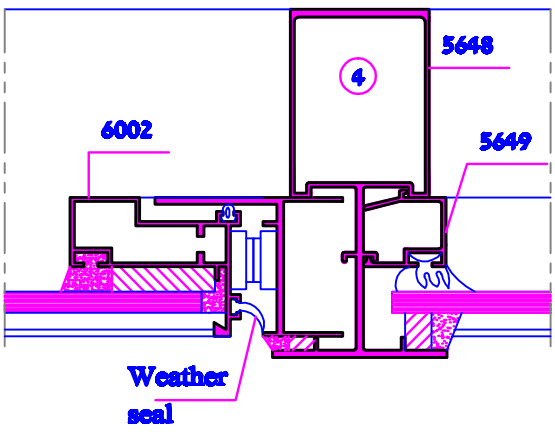
GROUP : 17A-1







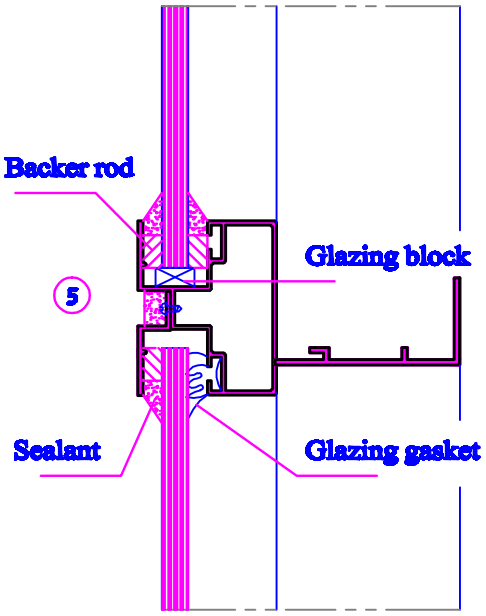


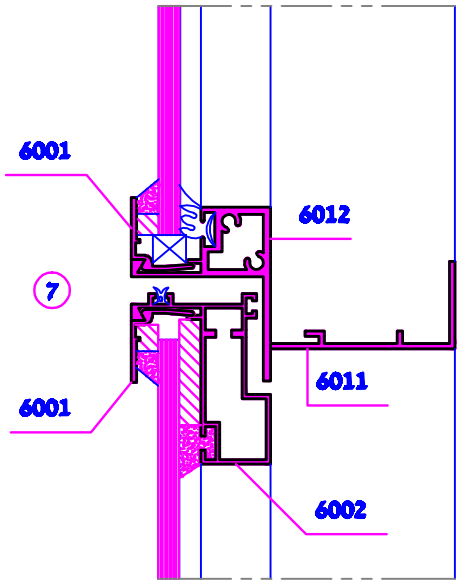


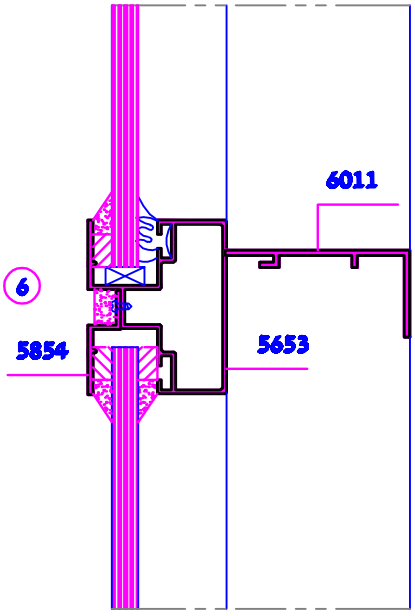
PT.ALEXINDO

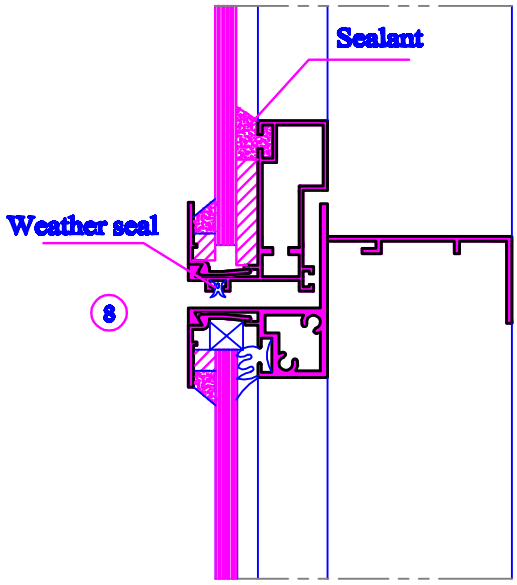
(Aluminium Extrusions Indonesia)

ECONOMY CURTAIN WALL ASSEMBLY DETAIL — GROUP : 17A-2



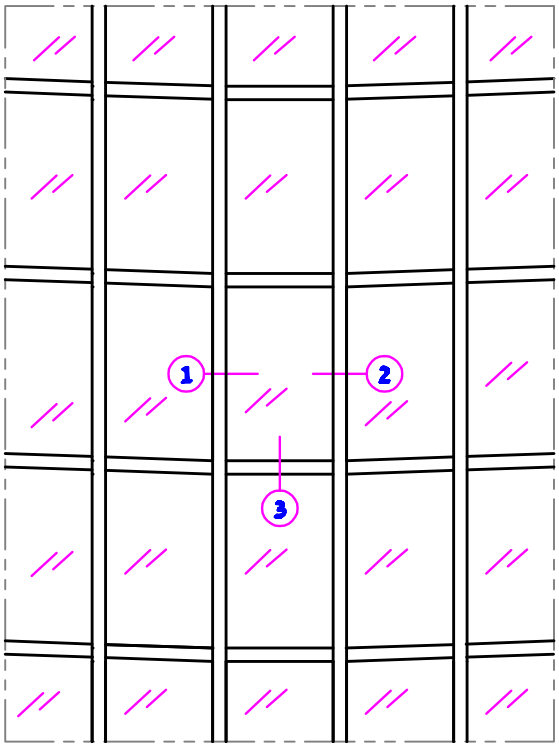


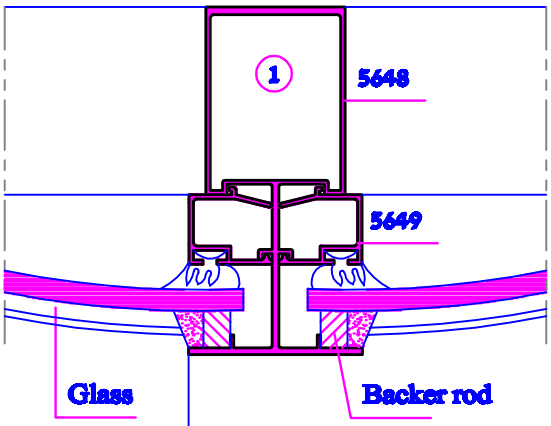


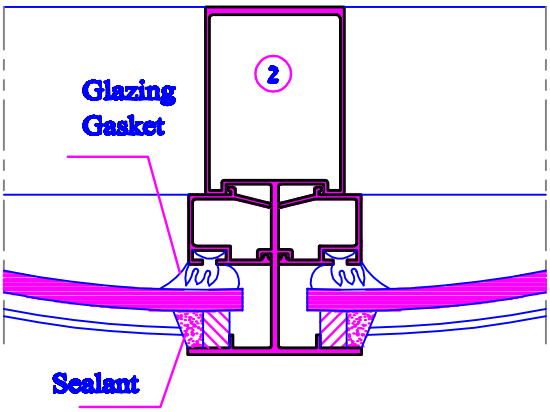


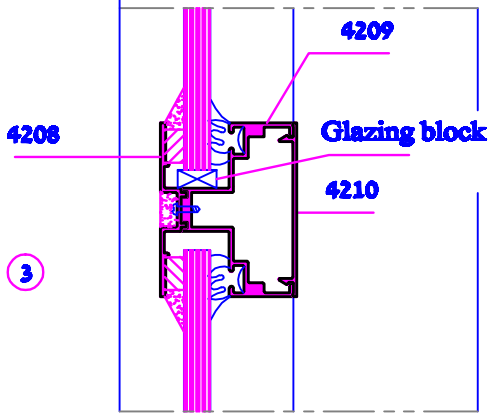
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

ECONOMY CURTAIN WALL ASSEMBLY DETAIL — GROUP : 17A-3

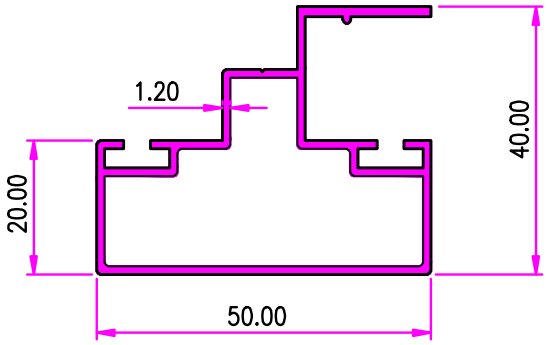






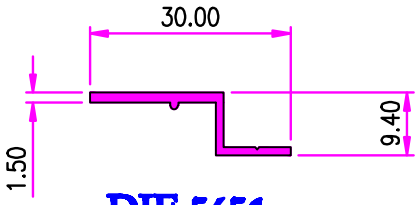


ECONOMY CURTAIN WALL SECTIONS — GROUP : 17B-1



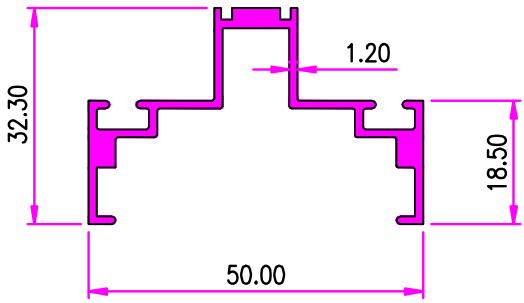
DIE 5653

W : 0.681 KG/M
P : 257.46 MM



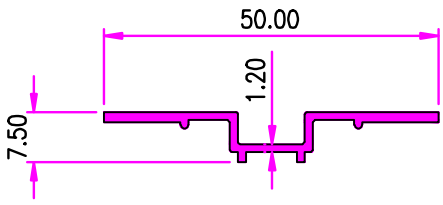
DIE 5654

W : 0.142 KG/M
P : 80.53 MM



DIE 4209

W : 0.536 KG/M
P : 267.68 MM

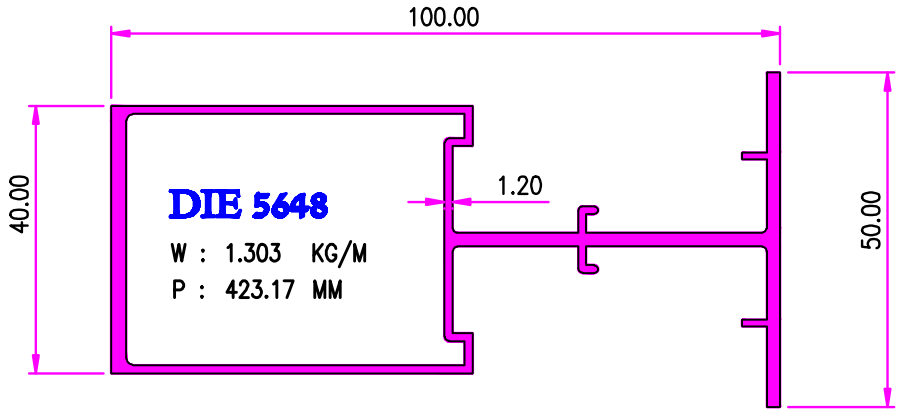


DIE 4208

W : 0.230 KG/M
P : 130.74 MM

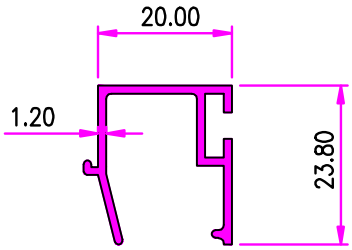
ECONOMY CURTAIN WALL SECTIONS

GROUP : 17B-2



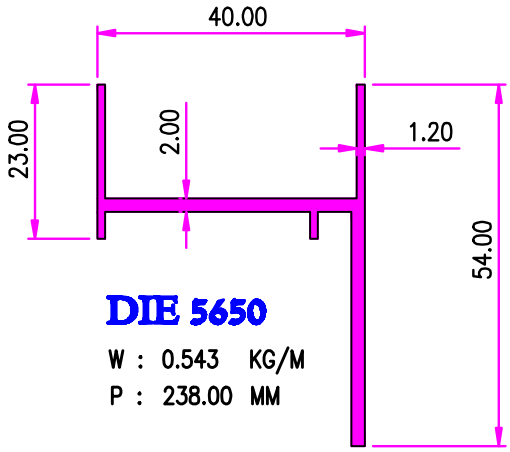
DIE 5648

W : 1.303 KG/M
P : 423.17 MM



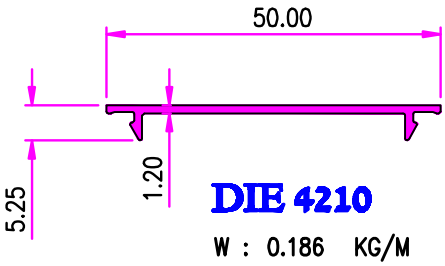
DIE 5649

W : 0.261 KG/M
P : 159.22 MM



DIE 5650

W : 0.543 KG/M
P : 238.00 MM

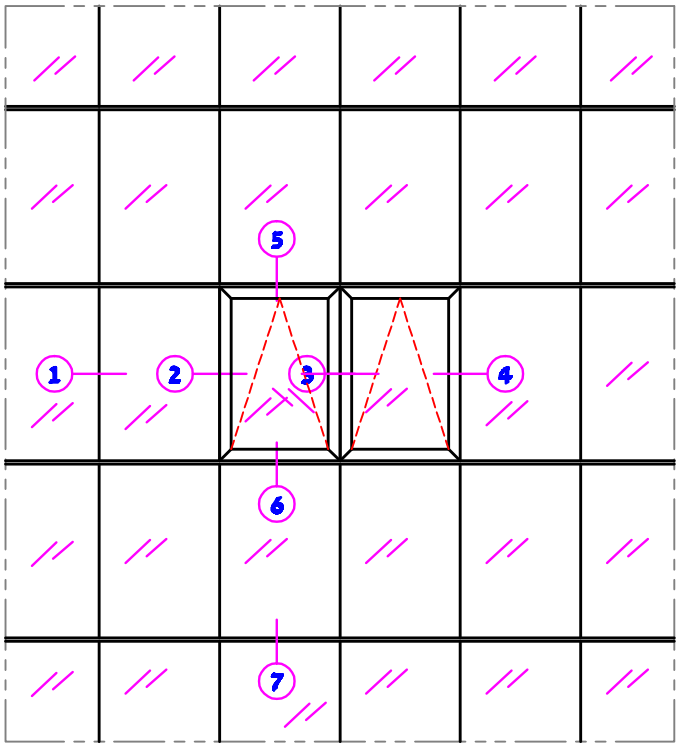


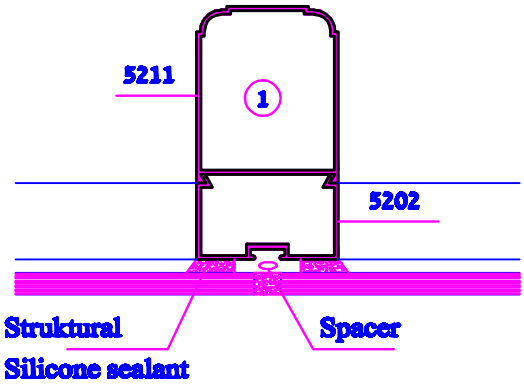
DIE 4210

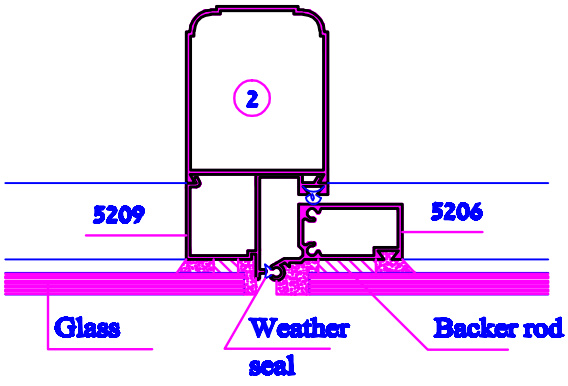
W : 0.186 KG/M
P : 118.12 MM

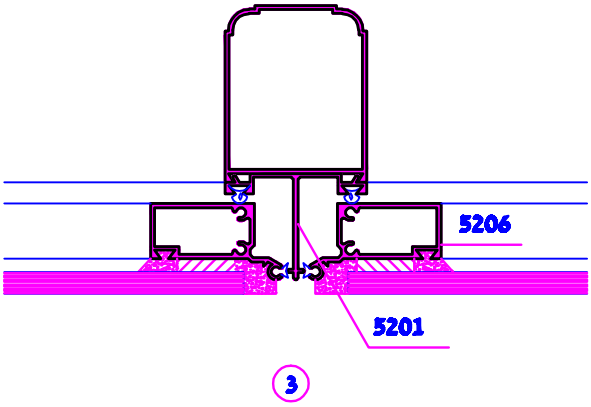
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

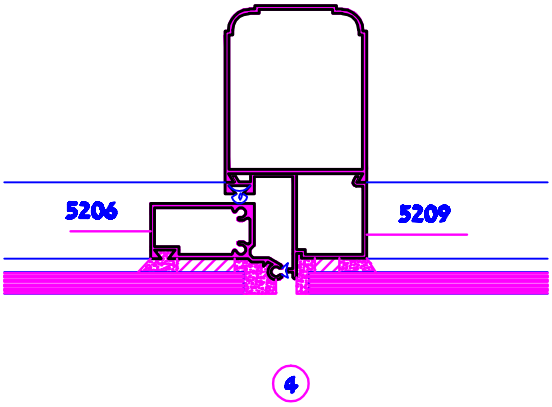
GLASS TO GLASS CURTAIN WALL ASSEMBLY DETAIL GROUP : 17C-1







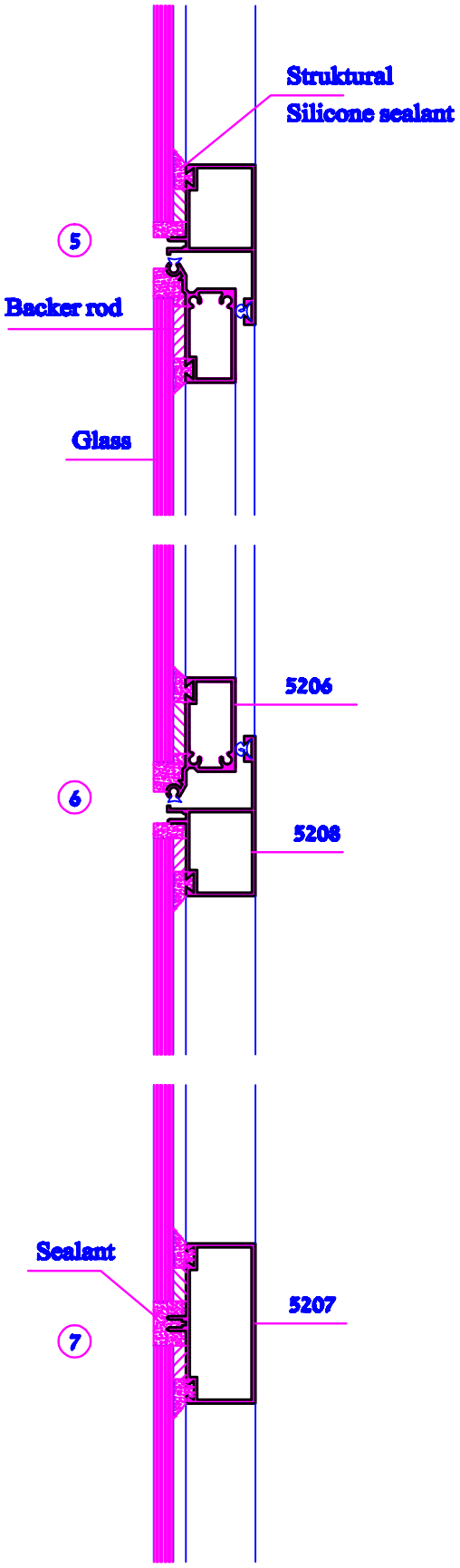




PT.ALEXINDO

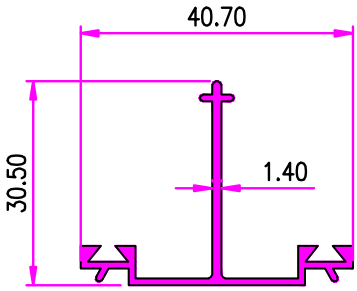
(Aluminium Extrusions Indonesia)

GLASS TO GLASS CURTAIN WALL ASSEMBLY DETAIL GROUP : 17C-2



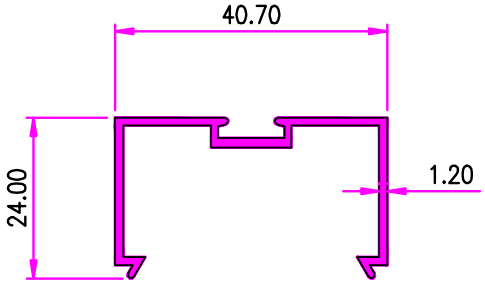
GLASS TO GLASS CURTAIN WALL SECTIONS

GROUP : 17D-1



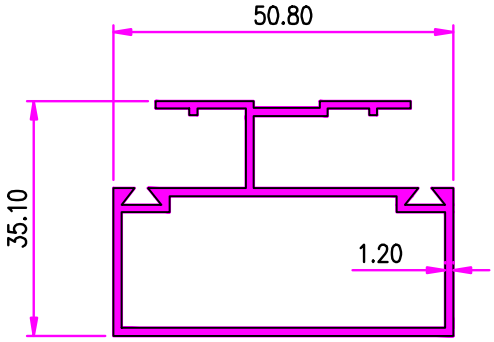
DIE 5201

W : 0.310 KG/M
P : 195.18 MM



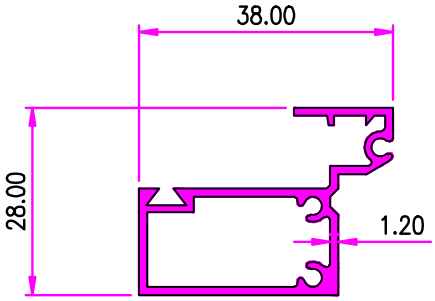
DIE 5202

W : 0.321 KG/M
P : 205.57 MM



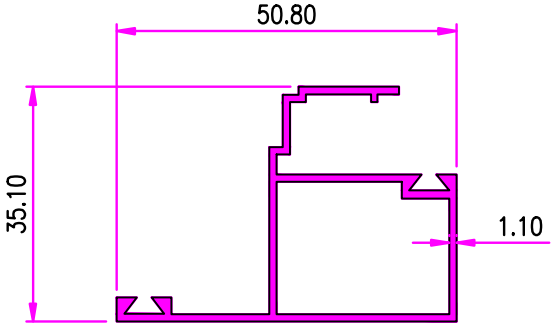
DIE 5203

W : 0.658 KG/M
P : 271.52 MM



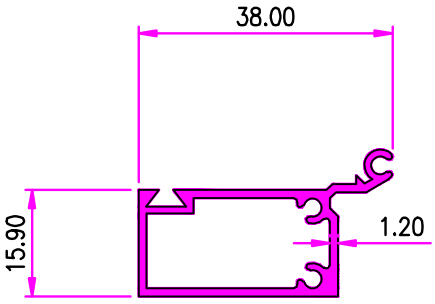
DIE 5204

W : 0.445 KG/M
P : 178.22 MM



DIE 5205

W : 0.497 KG/M
P : 235.80 MM

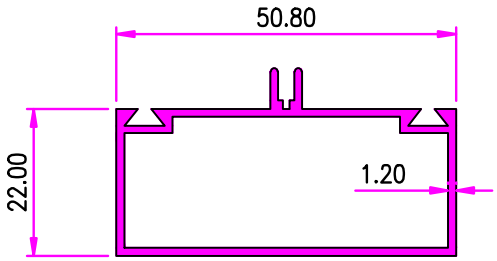


DIE 5206

W : 0.375 KG/M
P : 136.01 MM

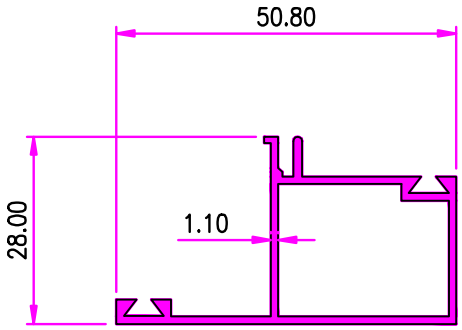
GLASS TO GLASS CURTAIN WALL SECTIONS

GROUP : 17D-2



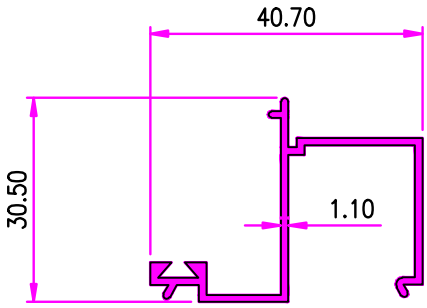
DIE 5207

W : 0.517 KG/M
P : 189.95 MM



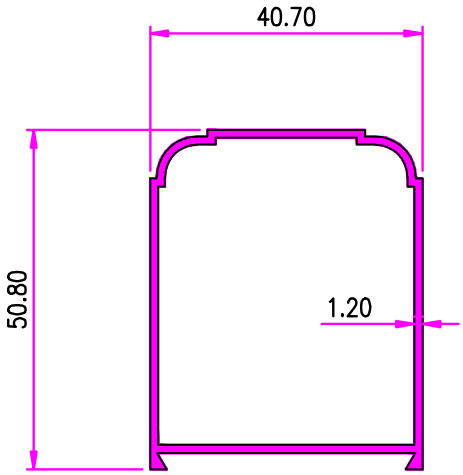
DIE 5208

W : 0.463 KG/M
P : 195.29 MM



DIE 5209

W : 0.329 KG/M
P : 222.09 MM

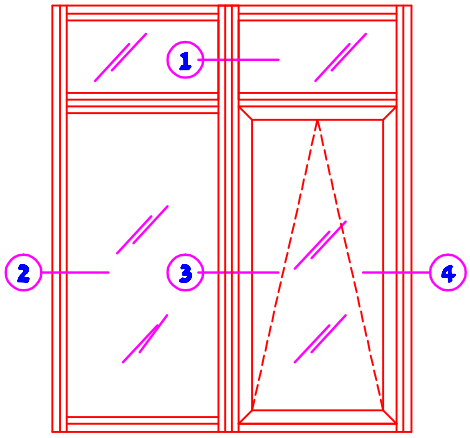


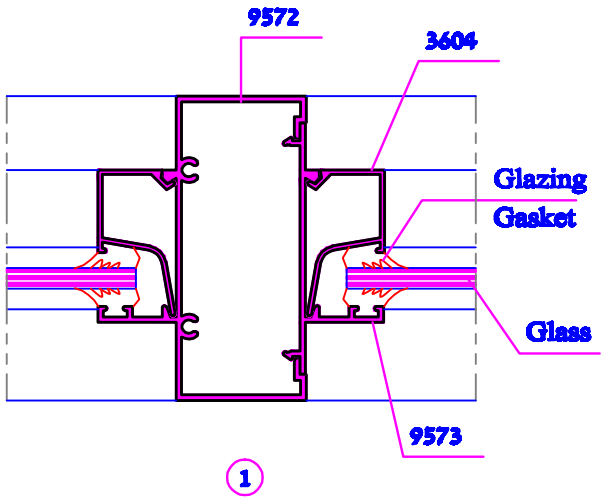
DIE 5211

W : 0.581 KG/M
P : 185.96 MM

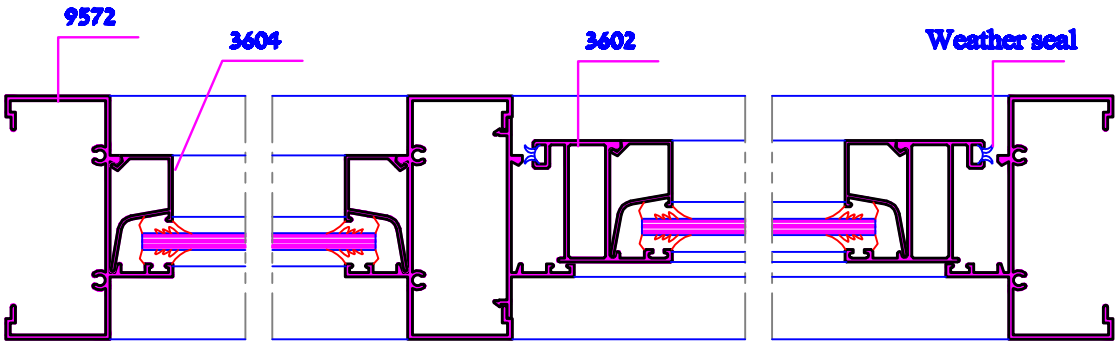
WINDOW WALL ASSEMBLY DETAIL

GROUP : 17E-1





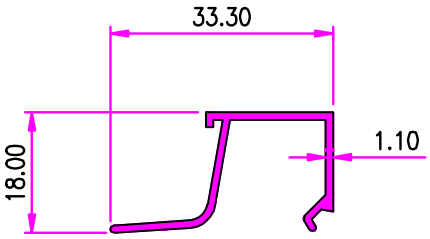
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7 8 9

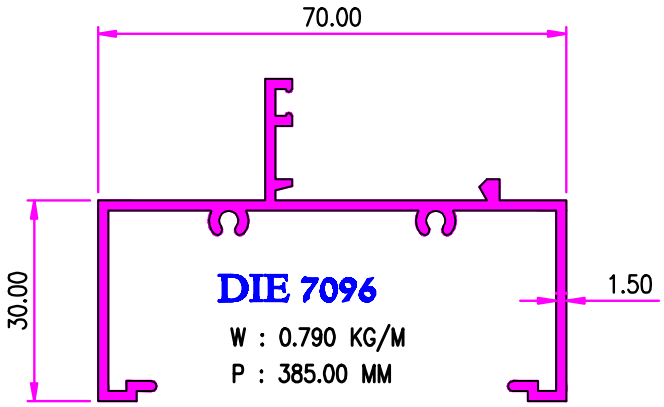
WINDOW WALL SECTIONS

GROUP : 17F-1



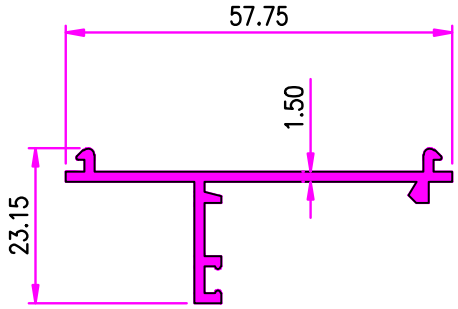
DIE 3317

W : 0.209 KG/M
P : 141.49 MM



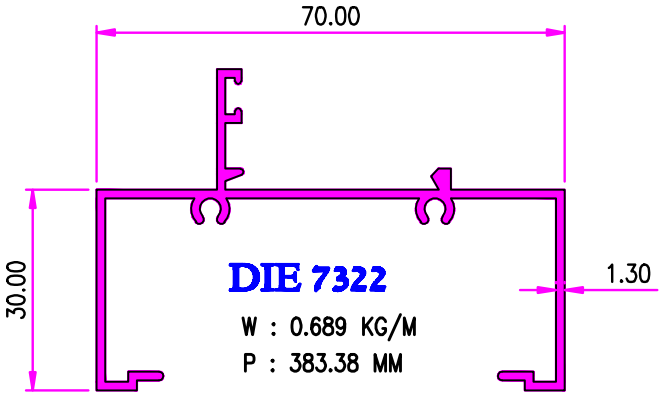
DIE 7096

W : 0.790 KG/M
P : 385.00 MM



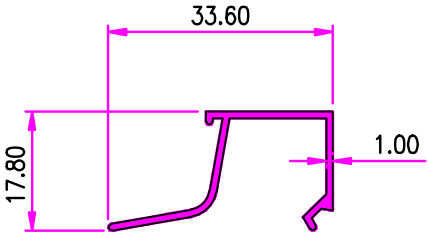
DIE 7097

W : 0.401 KG/M
P : 192.10 MM



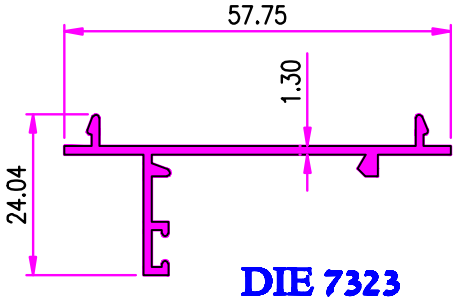
DIE 7322

W : 0.689 KG/M
P : 383.38 MM



DIE 3604

W : 0.186 KG/M
P : 136.31 MM

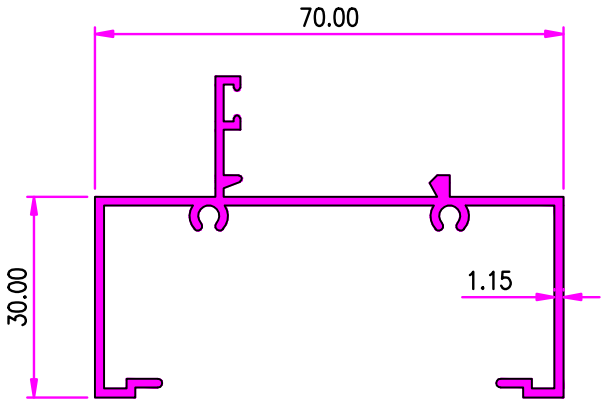


DIE 7323

W : 0.351 KG/M
P : 197.12 MM

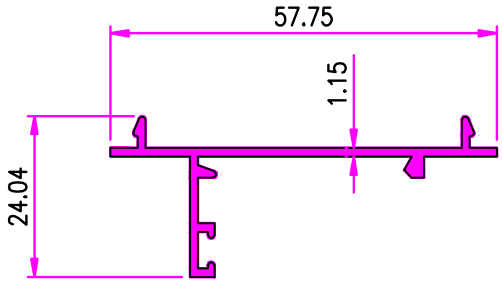
WINDOW WALL SECTIONS

GROUP : 17F-2



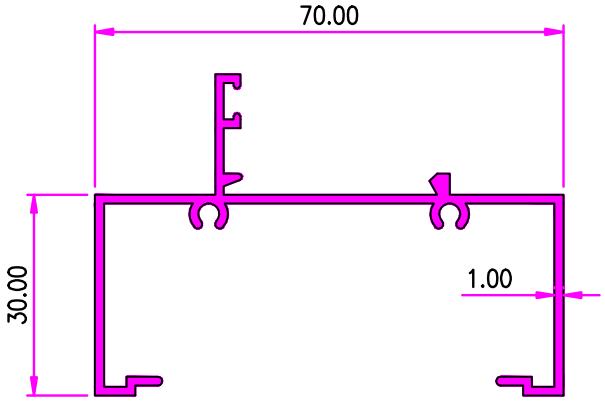
DIE 9217

W : 0.626 KG/M
P : 384.55 MM



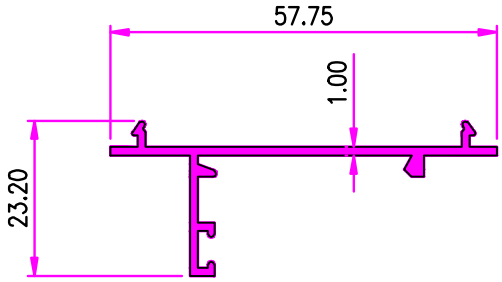
DIE 9218

W : 0.326 KG/M
P : 197.21 MM



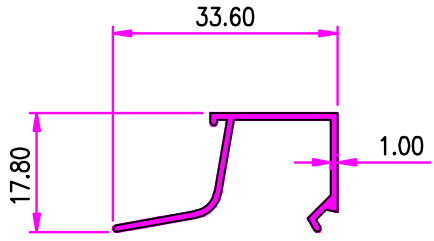
DIE 9572

W : 0.552 KG/M
P : 383.42 MM



DIE 9573

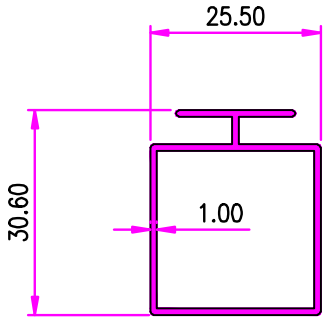
W : 0.285 KG/M
P : 194.99 MM



DIE 3604

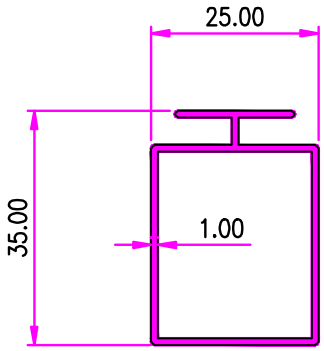
W : 0.186 KG/M
P : 136.31 MM

PARABOLA SECTIONS **GROUP : 17G-1**



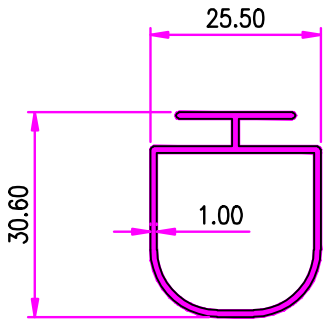
DIE 4617

W : 0.323 KG/M
P : 144.37 MM



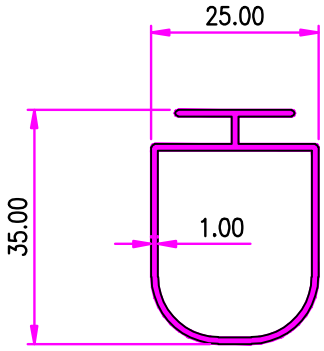
DIE 4619

W : 0.345 KG/M
P : 152.17 MM



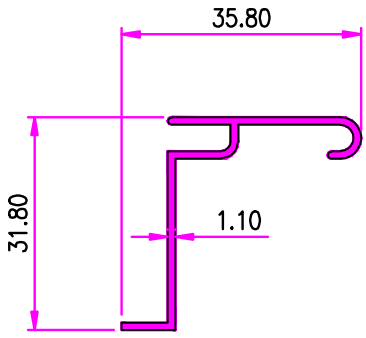
DIE 4618

W : 0.302 KG/M
P : 137.25 MM



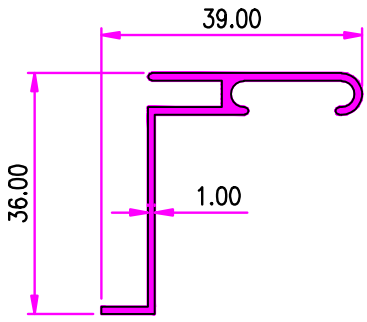
DIE 4620

W : 0.326 KG/M
P : 146.71 MM



DIE 4621

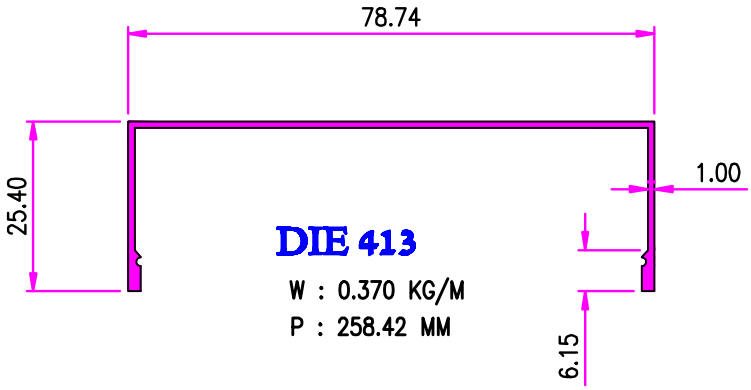
W : 0.243 KG/M
P : 165.50 MM



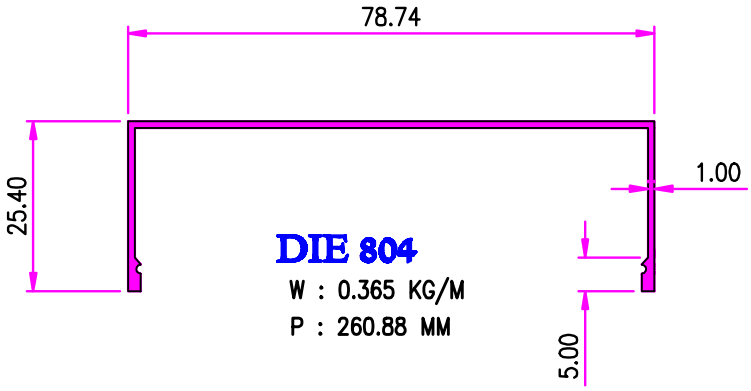
DIE 4622

W : 0.261 KG/M
P : 186.17 MM

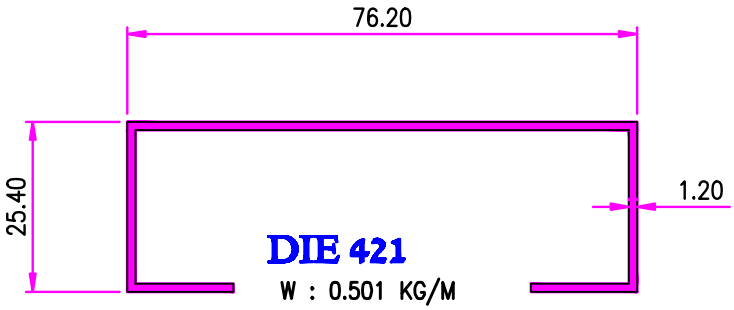
OTHERS **GROUP : 17H-1**



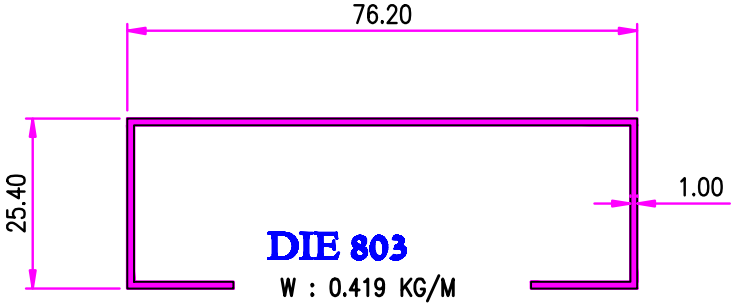
DIE 413
W : 0.370 KG/M
P : 258.42 MM



DIE 804
W : 0.365 KG/M
P : 260.88 MM



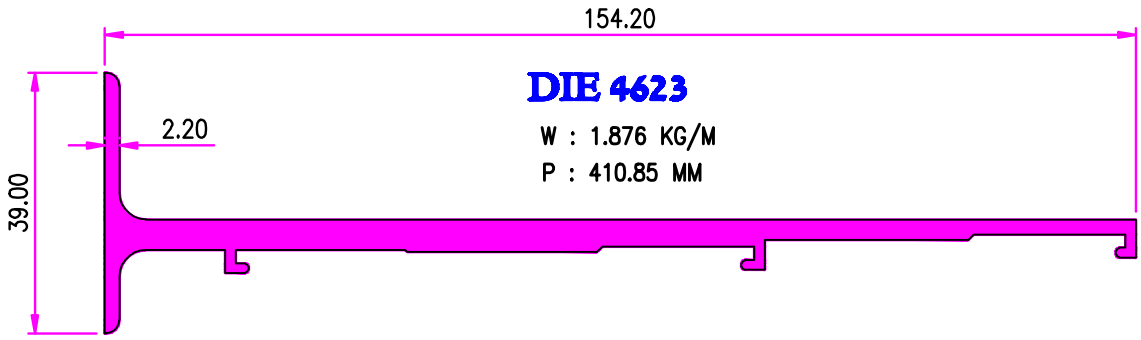
DIE 421
W : 0.501 KG/M
P : 310.32 MM



DIE 803
W : 0.419 KG/M
P : 313.52 MM

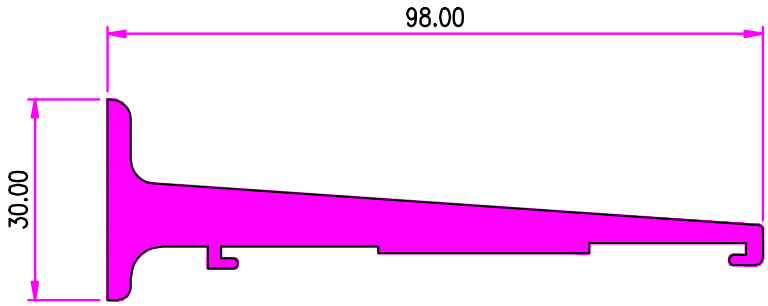
CURTAIN TRACK SECTIONS

GROUP : 18A-1



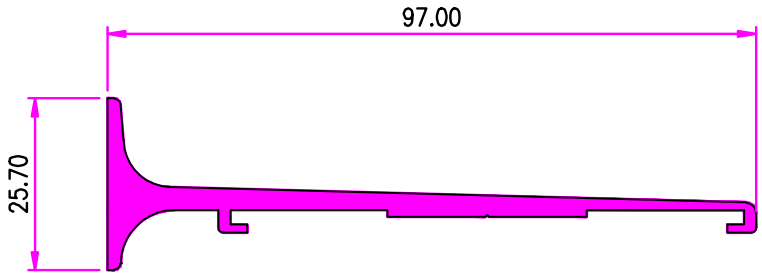
DIE 4623

W : 1.876 KG/M
P : 410.85 MM



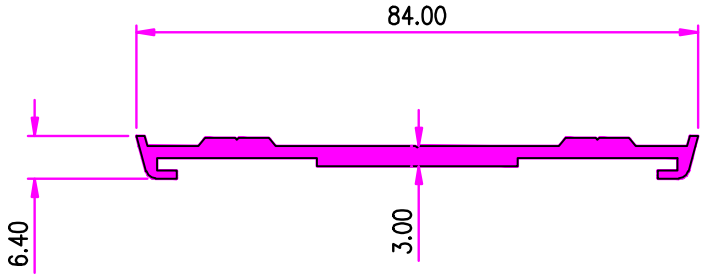
DIE 8602

W : 2.040 KG/M
P : 281.20 MM



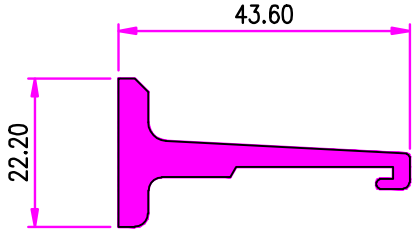
DIE 8483

W : 1.115 KG/M
P : 271.00 MM



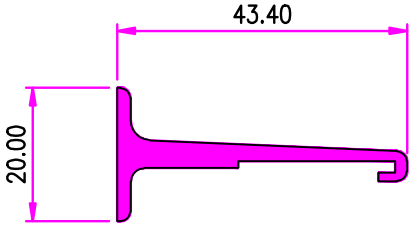
DIE 8484

W : 0.645 KG/M
P : 203.12 MM



DIE 8601

W : 0.670 KG/M
P : 137.30 MM

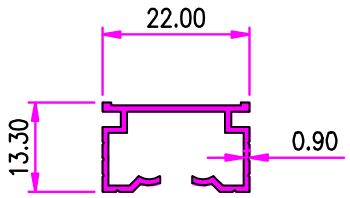


DIE 8482

W : 0.513 KG/M
P : 135.00 MM

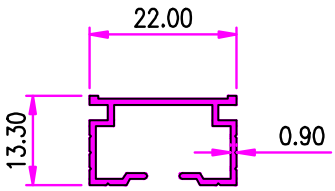
CURTAIN TRACK SECTIONS

GROUP : 18A-2



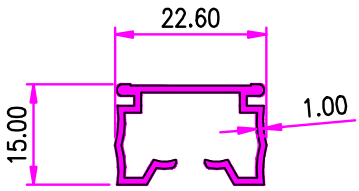
DIE 8481

W : 0.175 KG/M
P : 144.00 MM



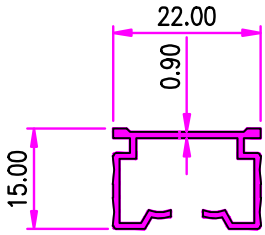
DIE 8485

W : 0.160 KG/M
P : 140.00 MM



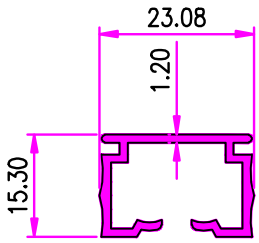
DIE 8486

W : 0.206 KG/M
P : 148.00 MM



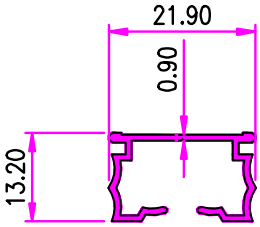
DIE 6118

W : 0.178 KG/M
P : 131.31 MM



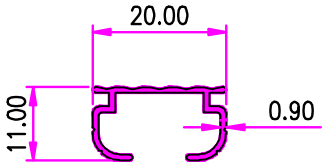
DIE 8561

W : 0.340 KG/M
P : 157.00 MM



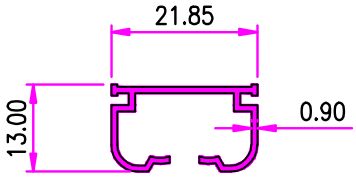
DIE 7107

W : 0.166 KG/M
P : 139.00 MM



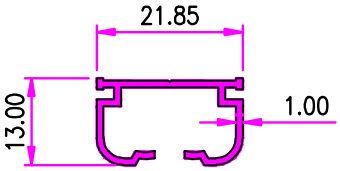
DIE 7066

W : 0.123 KG/M
P : 105.00 MM



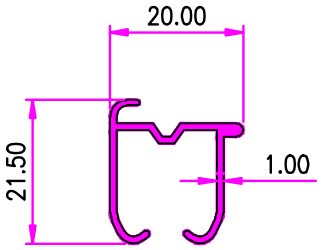
DIE 7071

W : 0.159 KG/M
P : 132.00 MM



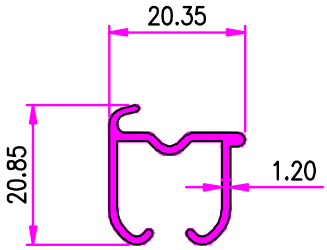
DIE 8138

W : 0.177 KG/M
P : 133.06 MM



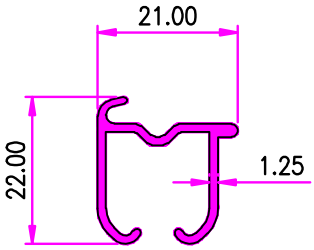
DIE 836

W : 0.195 KG/M
P : 136.86 MM



DIE 837A

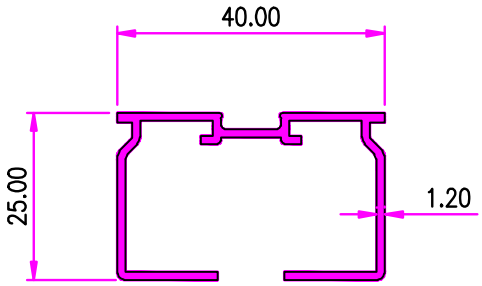
W : 0.237 KG/M
P : 138.30 MM



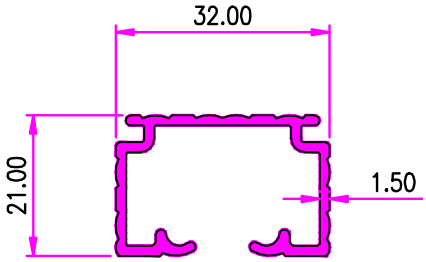
DIE 7579

W : 0.239 KG/M
P : 138.78 MM

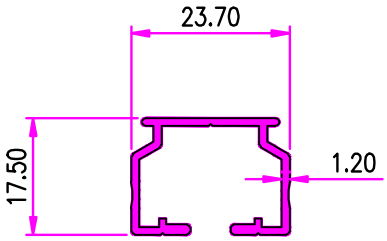
CURTAIN TRACK SECTIONS — GROUP : 18A-3



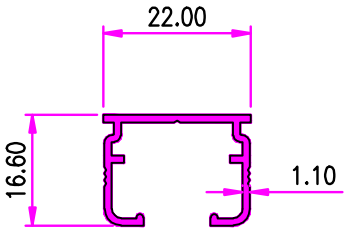
DIE 7315
W : 0.418 KG/M
P : 255.95 MM



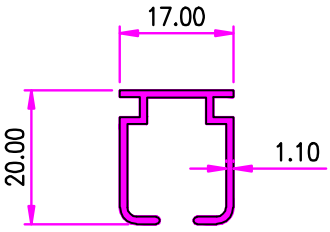
DIE 918
W : 0.386 KG/M
P : 210.00 MM



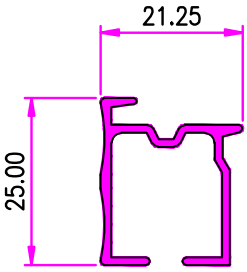
DIE 3568
W : 0.245 KG/M
P : 150.60 MM



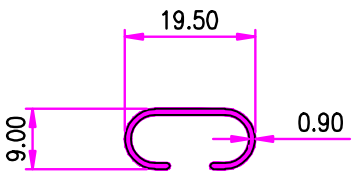
DIE 3569
W : 0.211 KG/M
P : 142.65 MM



DIE 838
W : 0.202 KG/M
P : 140.00 MM

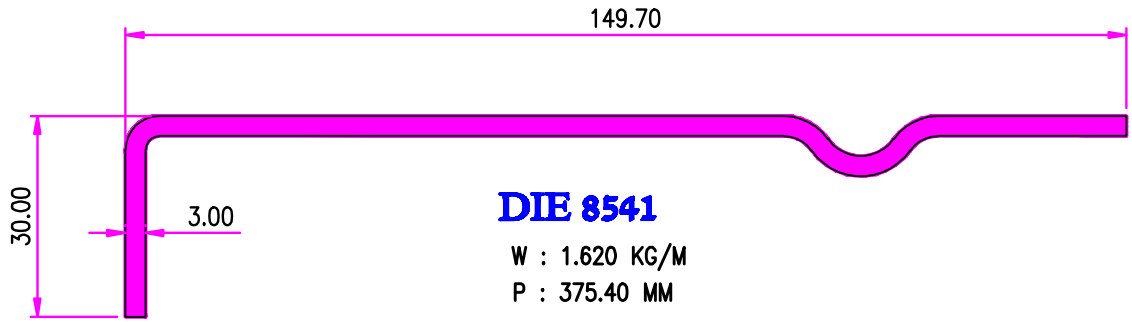


DIE 7079
W : 0.272 KG/M
P : 166.30 MM

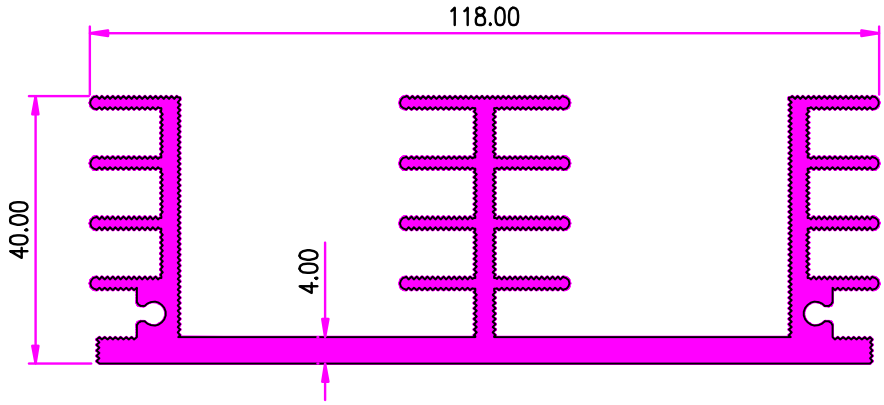


DIE 8415
W : 0.099 KG/M
P : 82.69 MM

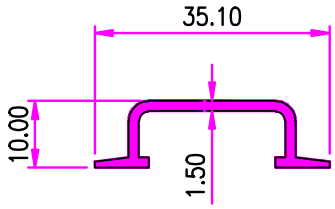
ELECTRICAL SECTIONS **GROUP : 18B-1**



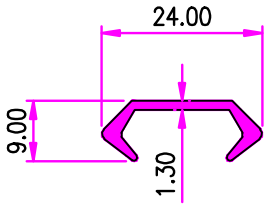
DIE 8541
W : 1.620 KG/M
P : 375.40 MM



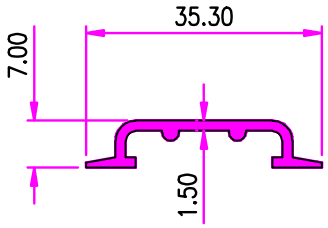
DIE 8837
W : 3.040 KG/M
P : 885.94 MM



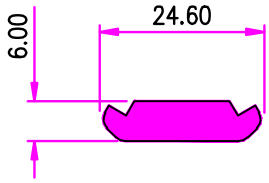
DIE 8608
W : 0.215 KG/M
P : 108.55 MM



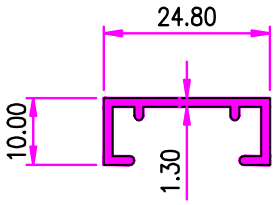
DIE 8737
W : 0.160 KG/M
P : 78.00 MM



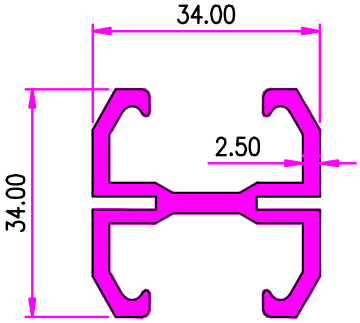
DIE 8787
W : 0.214 KG/M
P : 104.50 MM



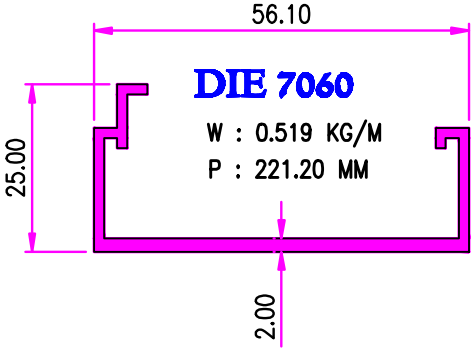
DIE 7061
W : 0.337 KG/M
P : 56.61 MM



DIE 8778
W : 0.196 KG/M
P : 108.20 MM



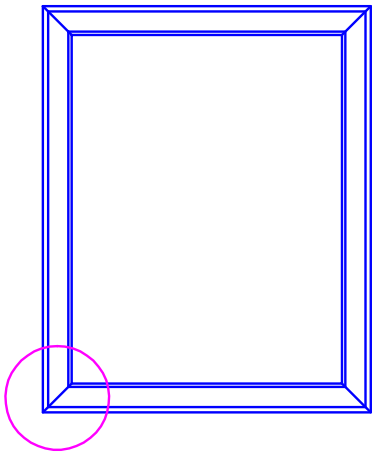
DIE 7059
W : 0.850 KG/M
P : 261.53 MM

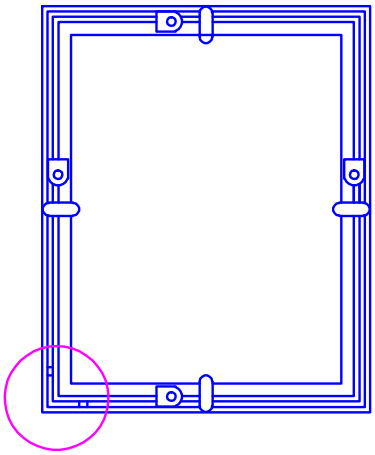


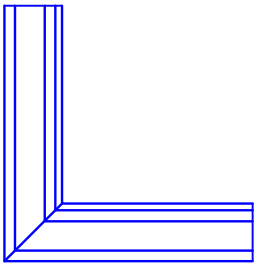
DIE 7060
W : 0.519 KG/M
P : 221.20 MM

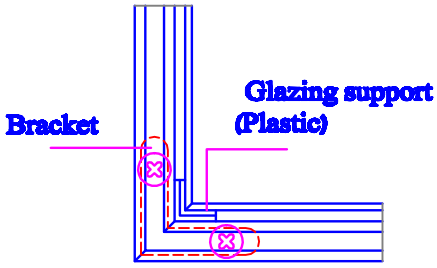
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

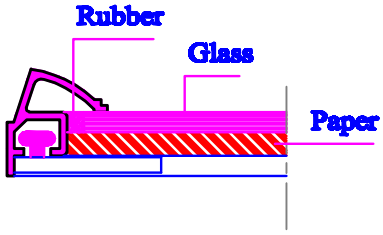
FICTURE FRAME ASSEMBLY DETAIL **GROUP : 18C-1**





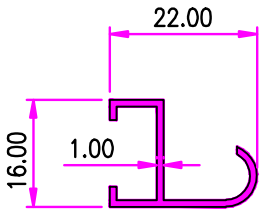




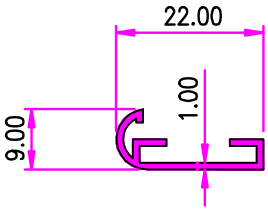


FICTURE FRAME SECTIONS

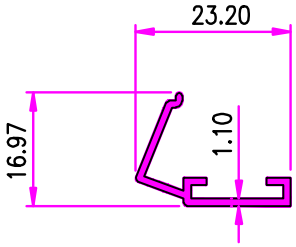
GROUP : 18D-1



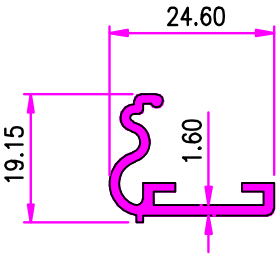
DIE 5524
W : 0.148 KG/M
P : 111.47 MM



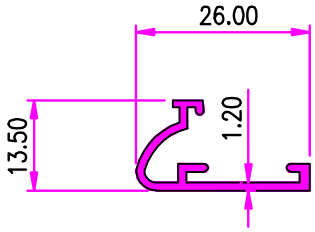
DIE 5525
W : 0.122 KG/M
P : 92.03 MM



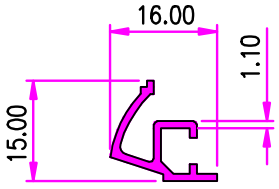
DIE 6604
W : 0.146 KG/M
P : 99.60 MM



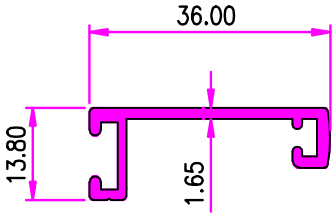
DIE 6605
W : 0.246 KG/M
P : 124.67 MM



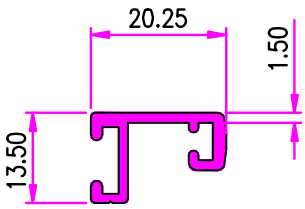
DIE 6606
W : 0.181 KG/M
P : 112.07MM



DIE 8364
W : 0.134 KG/M
P : 92.50 MM



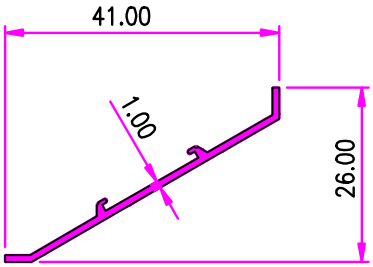
DIE 8368
W : 0.308 KG/M
P : 144.50 MM



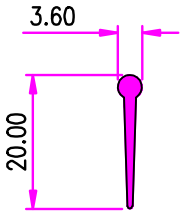
DIE 8369
W : 0.230 KG/M
P : 113.00 MM

AIR VENT SECTIONS

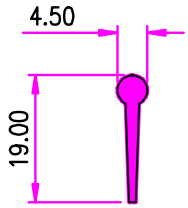
GROUP : 18E-1



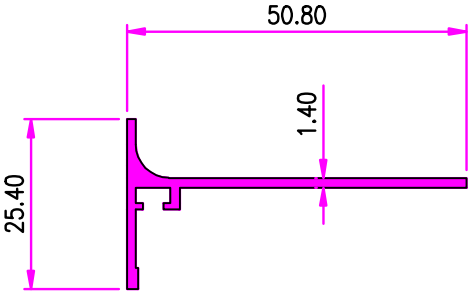
DIE 7161
W : 0.150 KG/M
P : 115.30 MM



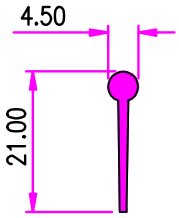
DIE 8728
W : 0.082 KG/M
P : 43.61 MM



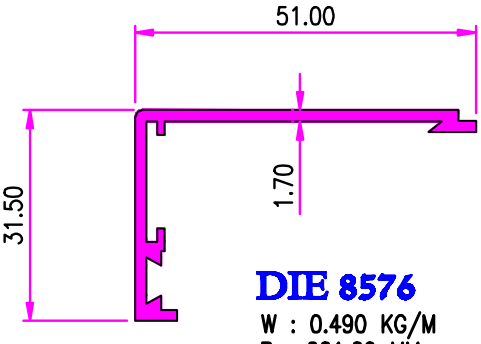
DIE 8577
W : 0.120 KG/M
P : 43.00 MM



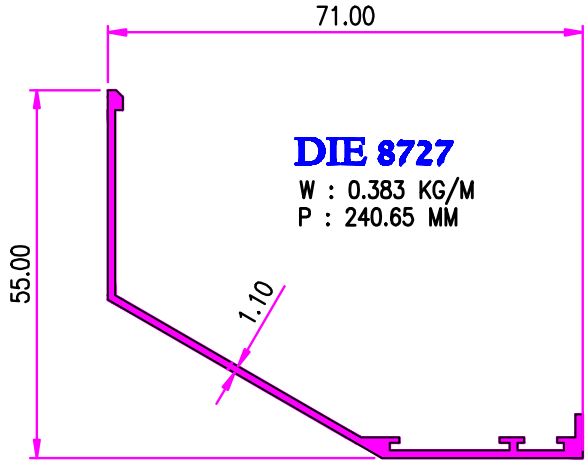
DIE 8730
W : 0.313 KG/M
P : 164.00 MM



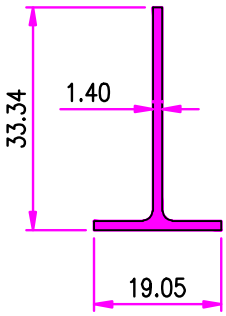
DIE 7213
W : 0.098 KG/M
P : 46.64 MM



DIE 8576
W : 0.490 KG/M
P : 201.00 MM



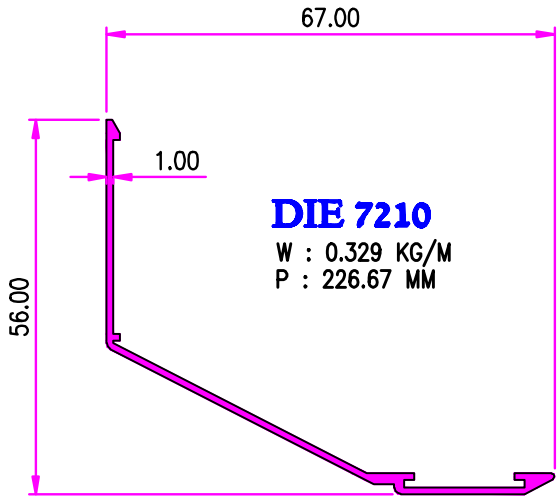
DIE 8727
W : 0.383 KG/M
P : 240.65 MM



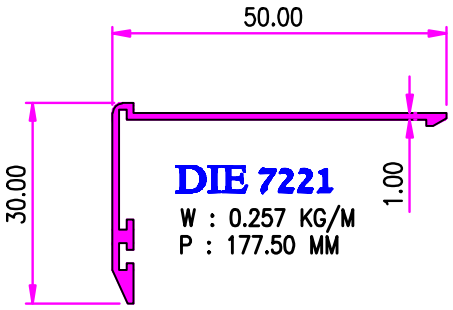
DIE 8729
W : 0.213 KG/M
P : 104.78 MM

AIR VENT SECTIONS

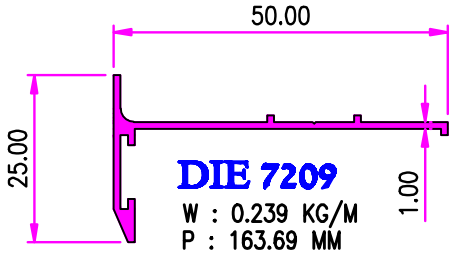
GROUP : 18E-2



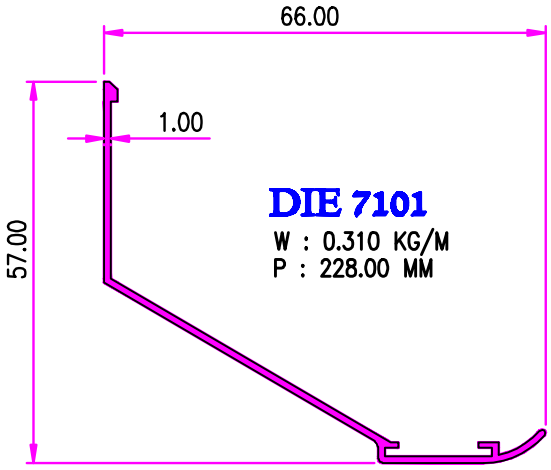
DIE 7210
W : 0.329 KG/M
P : 226.67 MM



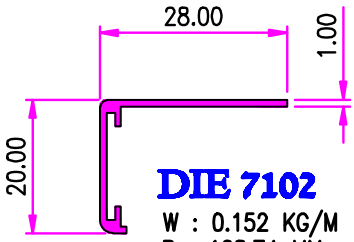
DIE 7221
W : 0.257 KG/M
P : 177.50 MM



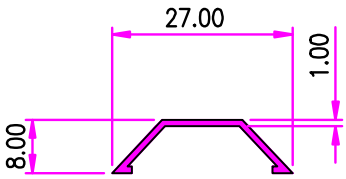
DIE 7209
W : 0.239 KG/M
P : 163.69 MM



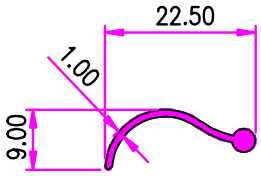
DIE 7101
W : 0.310 KG/M
P : 228.00 MM



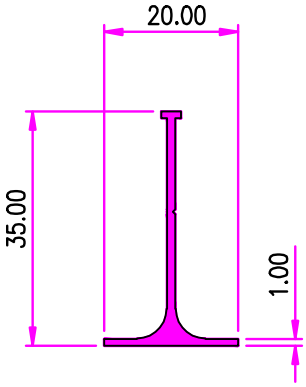
DIE 7102
W : 0.152 KG/M
P : 108.74 MM



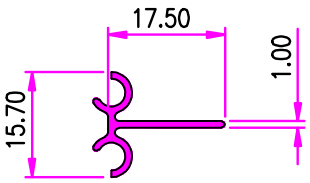
DIE 7218
W : 0.093 KG/M
P : 70.97 MM



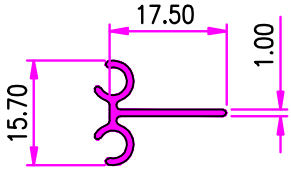
DIE 7215
W : 0.096 KG/M
P : 62.00 MM



DIE 7217
W : 0.194 KG/M
P : 110.07 MM



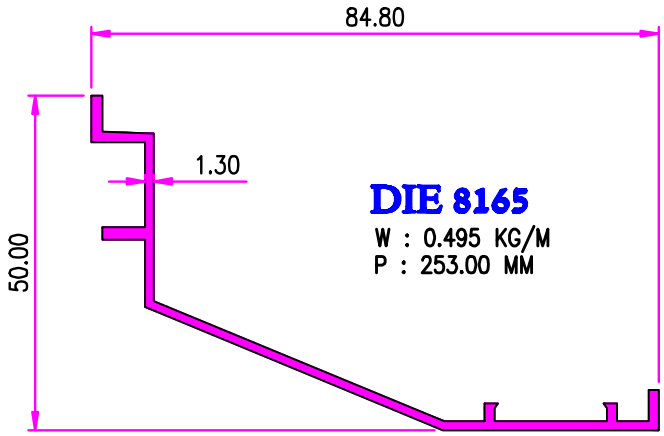
DIE 7214
W : 0.119 KG/M
P : 66.00 MM



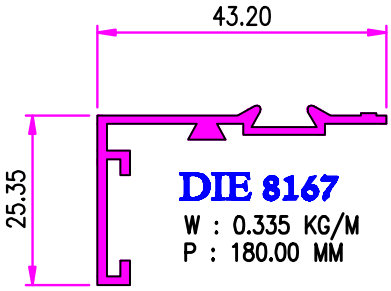
DIE 7214R
W : 0.123 KG/M
P : 89.74 MM

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

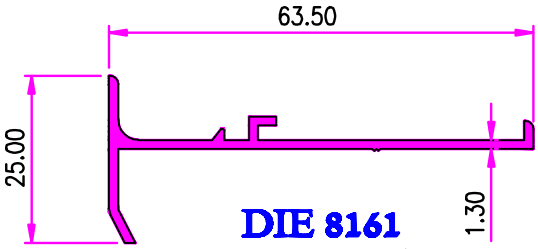
AIR VENT SECTIONS **GROUP : 18E-3**



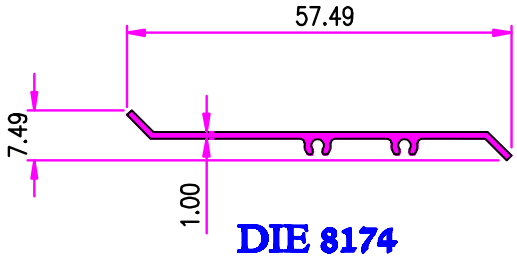
DIE 8165
W : 0.495 KG/M
P : 253.00 MM



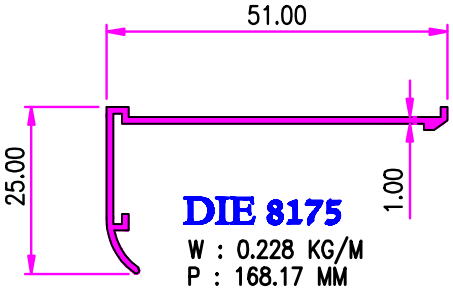
DIE 8167
W : 0.335 KG/M
P : 180.00 MM



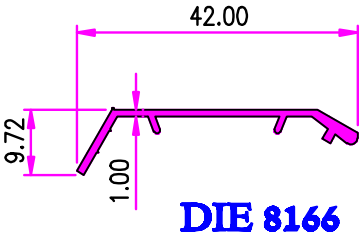
DIE 8161
W : 0.357 KG/M
P : 253.00 MM



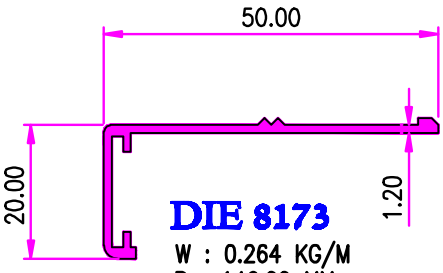
DIE 8174
W : 0.192 KG/M
P : 142.11 MM



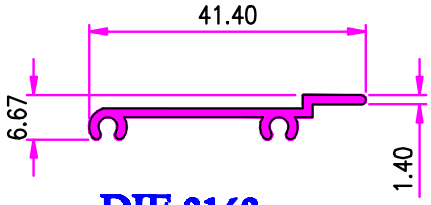
DIE 8175
W : 0.228 KG/M
P : 168.17 MM



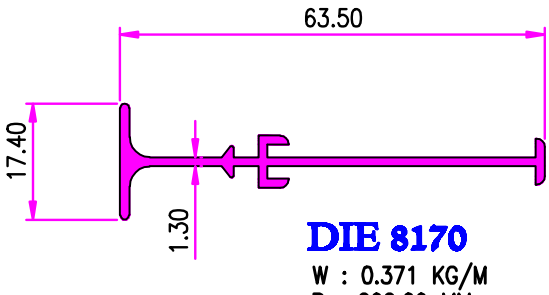
DIE 8166
W : 0.195 KG/M
P : 121.00 MM



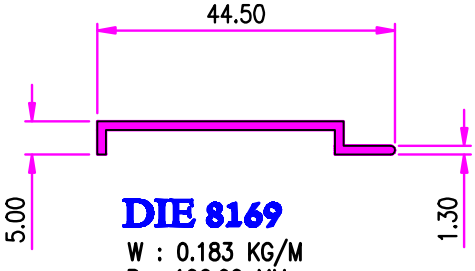
DIE 8173
W : 0.264 KG/M
P : 146.00 MM



DIE 8168
W : 0.212 KG/M
P : 96.00 MM



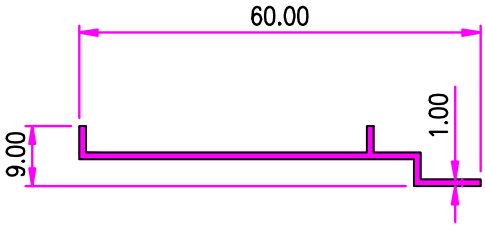
DIE 8170
W : 0.371 KG/M
P : 202.00 MM



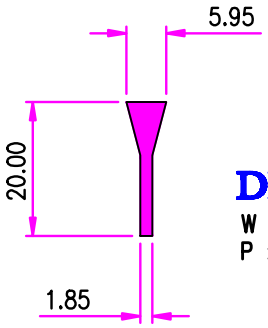
DIE 8169
W : 0.183 KG/M
P : 106.00 MM

AIR VENT SECTIONS

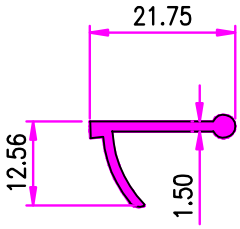
GROUP : 18E-4



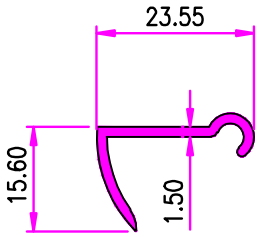
DIE 8176
W : 0.195 KG/M
P : 146.00 MM



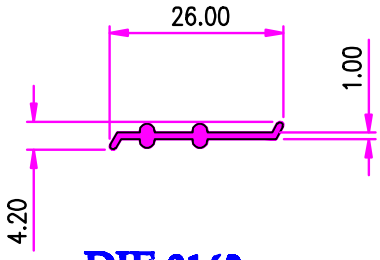
DIE 8164
W : 0.145 KG/M
P : 48.00 MM



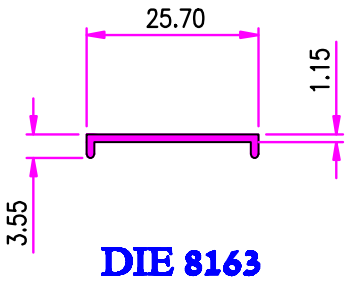
DIE 8172R
W : 0.152 KG/M
P : 72.84 MM



DIE : A8171
W : 0.178 KG/M
P : 91.50 MM



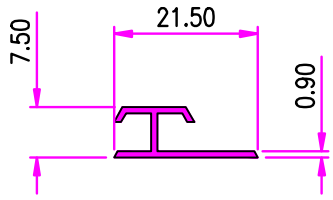
DIE 8162
W : 0.104 KG/M
P : 60.00 MM



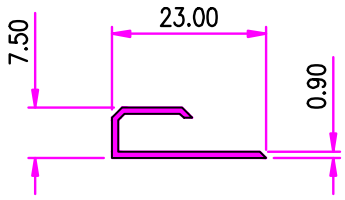
DIE 8163
W : 0.095 KG/M
P : 63.00 MM

WALL BOARD SECTIONS

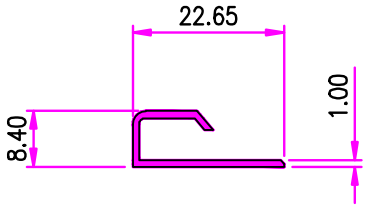
GROUP : 18F-1



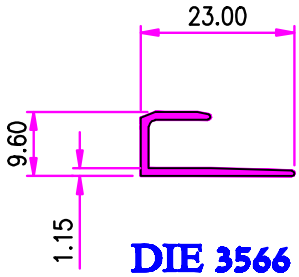
DIE 8503
W : 0.097 KG/M
P : 81.30 MM



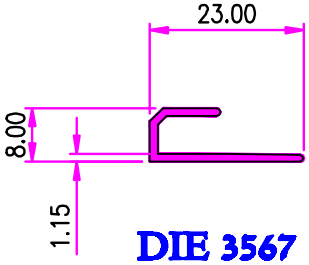
DIE 8504
W : 0.095 KG/M
P : 75.00 MM



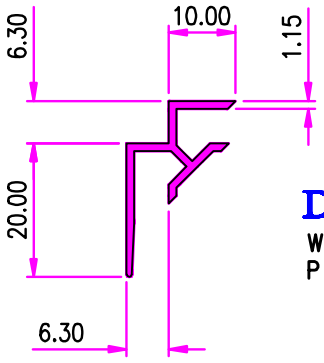
DIE 8402
W : 0.117 KG/M
P : 83.50 MM



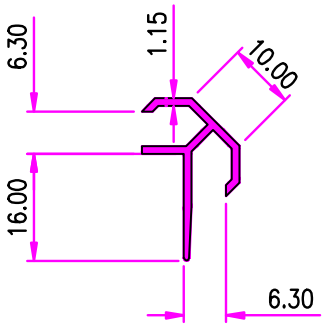
DIE 3566
W : 0.117 KG/M
P : 81.40 MM



DIE 3567
W : 0.116 KG/M
P : 77.68 MM

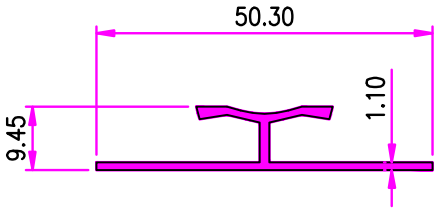


DIE 8501
W : 0.171 KG/M
P : 115.51 MM

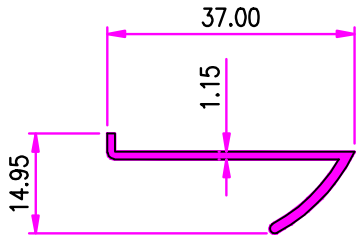


DIE 8502
W : 0.156 KG/M
P : 105.38 MM

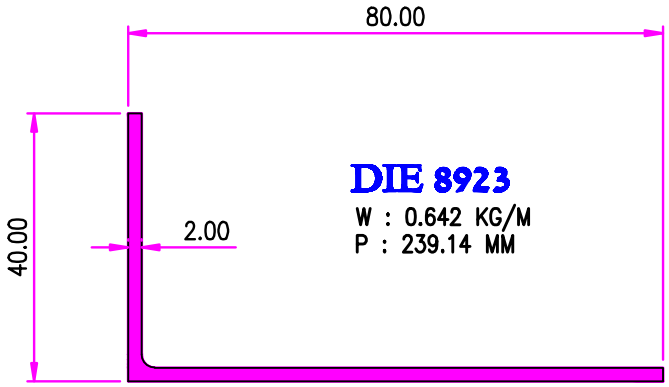
CARPET SECTIONS **GROUP : 18G-1**



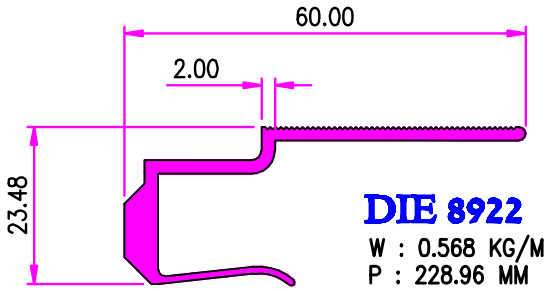
DIE 8340
W : 0.239 KG/M
P : 181.40 MM



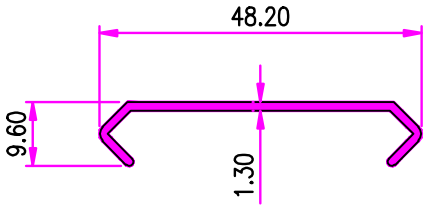
DIE 8341
W : 0.191 KG/M
P : 122.00 MM



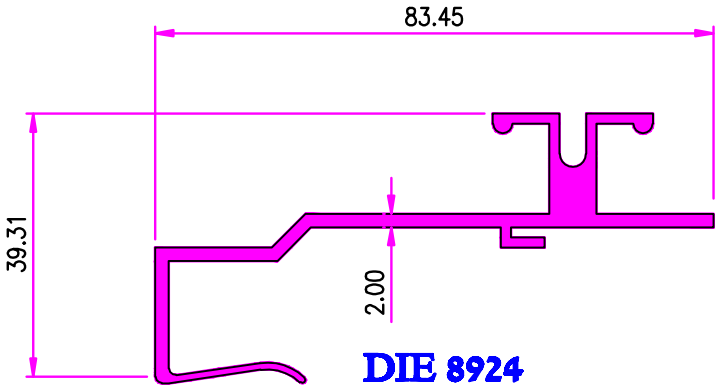
DIE 8923
W : 0.642 KG/M
P : 239.14 MM



DIE 8922
W : 0.568 KG/M
P : 228.96 MM



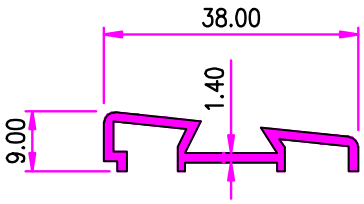
DIE 8926
W : 0.222 KG/M
P : 128.18 MM



DIE 8924
W : 0.944 KG/M
P : 350.39 MM

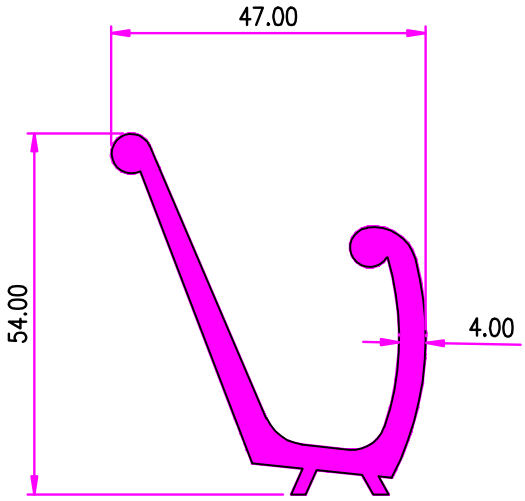
ADJUST HOOK SECTIONS

GROUP : 18H-1



DIE 8671

W : 0.282 KG/M
P : 140.80 MM

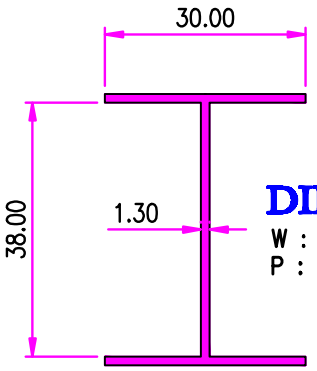


DIE 8672

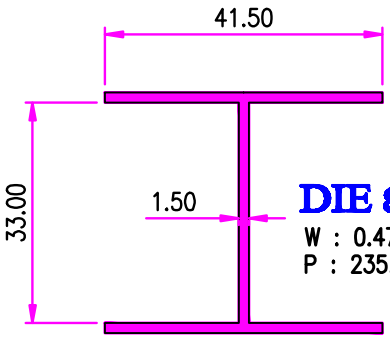
W : 1.218 KG/M
P : 243.58 MM

PT.ALEXINDO
(Aluminium Extrusions Indonesia)

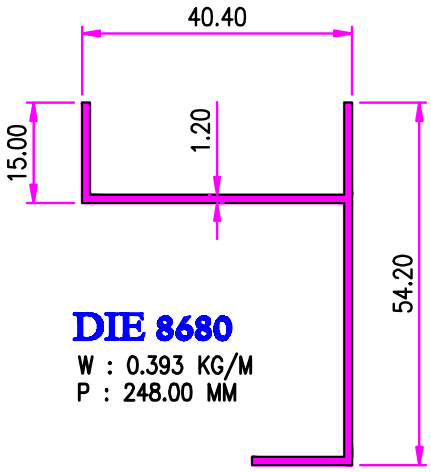
LOW COST HOUSING SECTIONS — GROUP : 18I-1



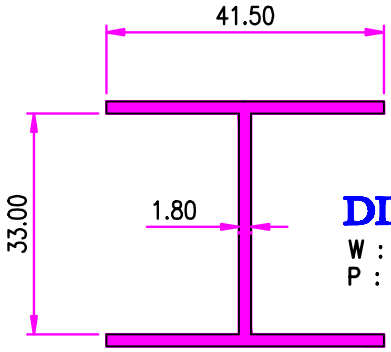
DIE 8673
W : 0.345 KG/M
P : 193.40 MM



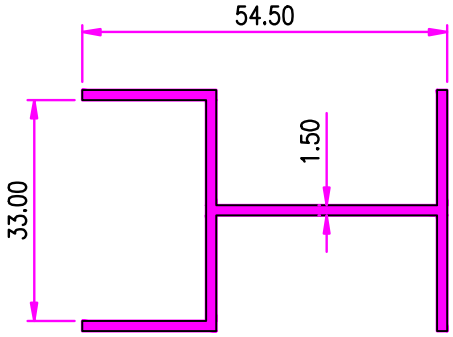
DIE 8674
W : 0.472 KG/M
P : 235.00 MM



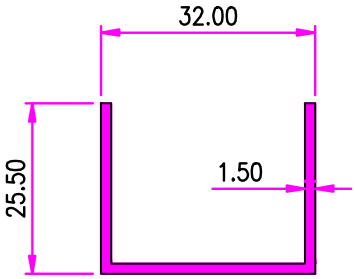
DIE 8680
W : 0.393 KG/M
P : 248.00 MM



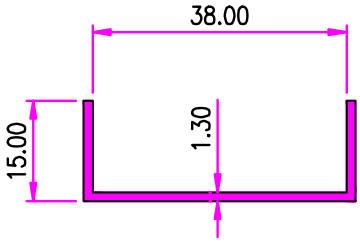
DIE 8675
W : 0.566 KG/M
P : 235.60 MM



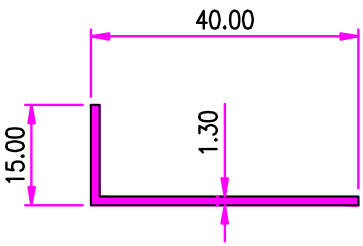
DIE 8676
W : 0.577 KG/M
P : 287.00 MM



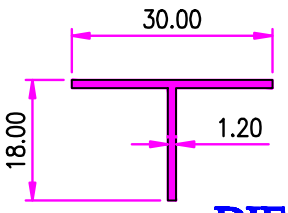
DIE 633
W : 0.325 KG/M
P : 163.00 MM



DIE 578
W : 0.221 KG/M
P : 138.40 MM



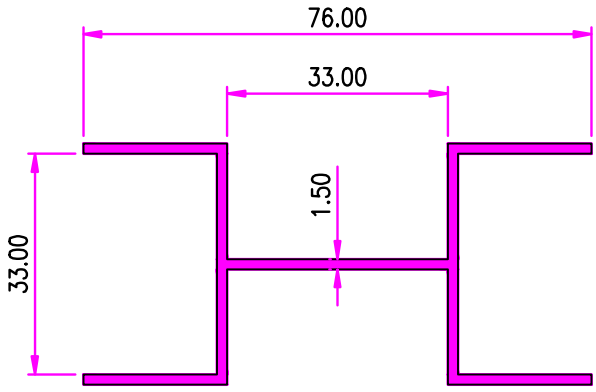
DIE 587
W : 0.189 KG/M
P : 248.00 MM



DIE 1540
W : 0.152 KG/M
P : 96.00 MM

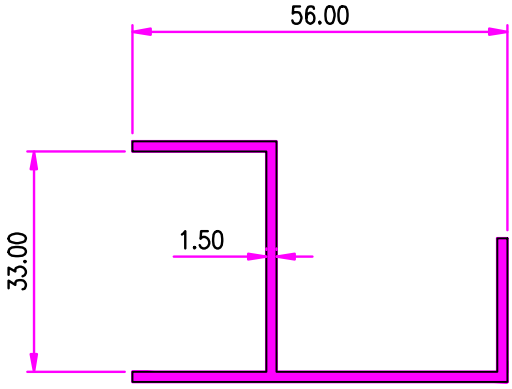
LOW COST HOUSING SECTIONS

GROUP : 18I-2



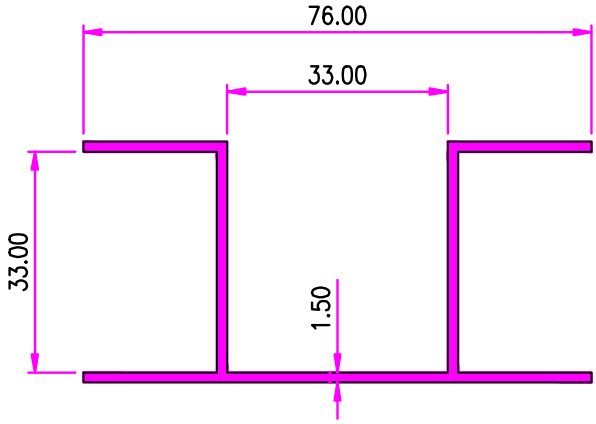
DIE 8677

W : 0.752 KG/M
P : 373.00 MM



DIE 8678

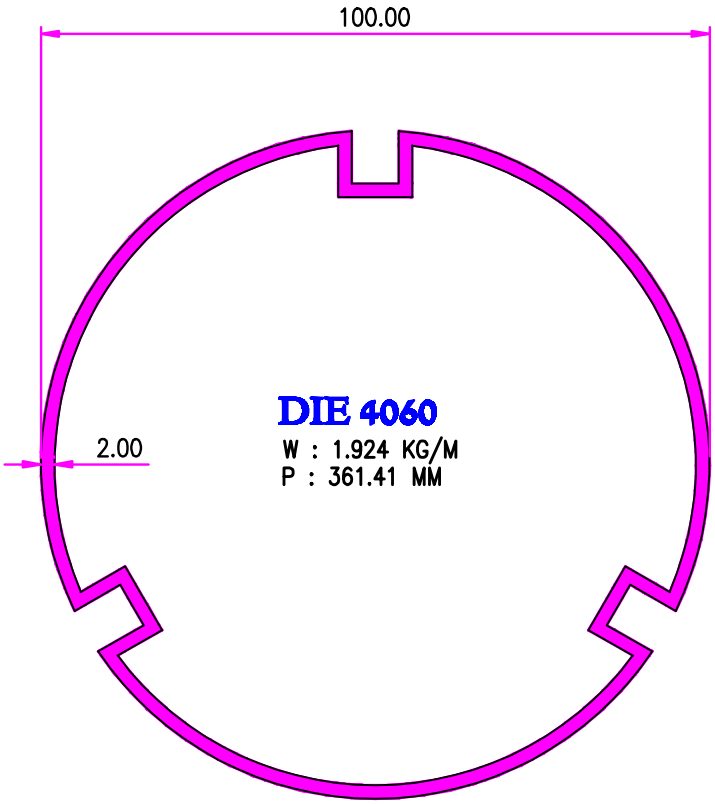
W : 0.530 KG/M
P : 264.00 MM



DIE 8679

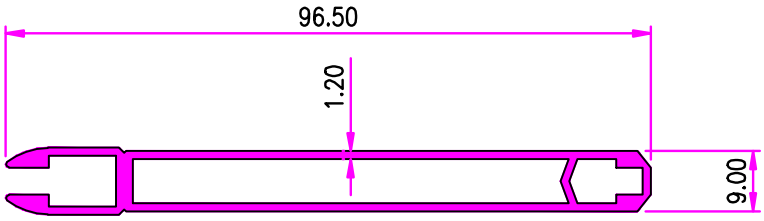
W : 0.752 KG/M
P : 373.00 MM

TEXTILE SECTIONS **GROUP : 18J-1**



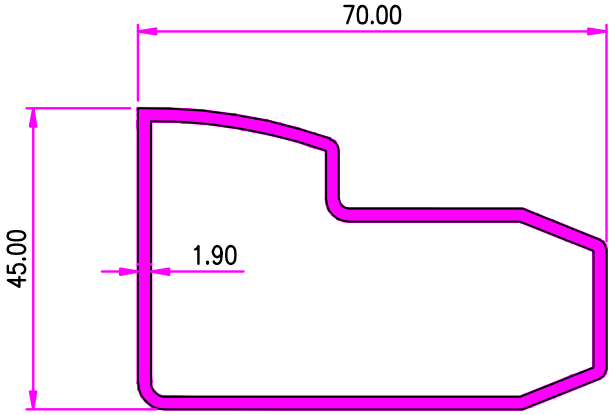
DIE 4060

W : 1.924 KG/M
P : 361.41 MM



DIE 6158

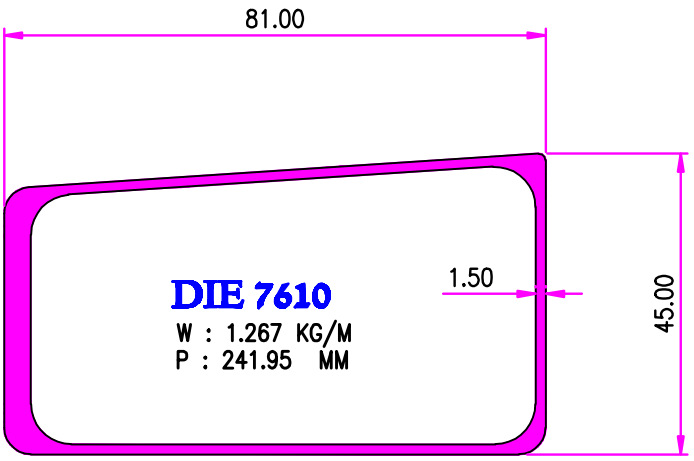
W : 0.769 KG/M
P : 242.18 MM

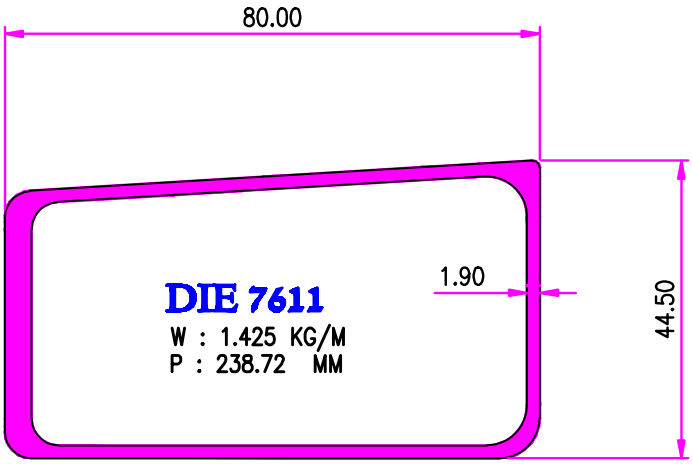


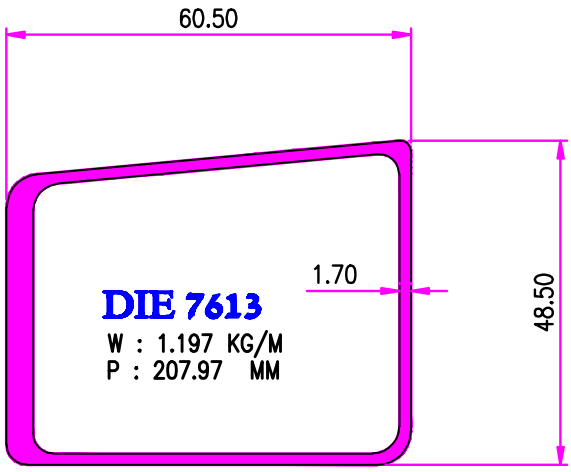
DIE 6159

W : 1.070 KG/M
P : 214.00 MM

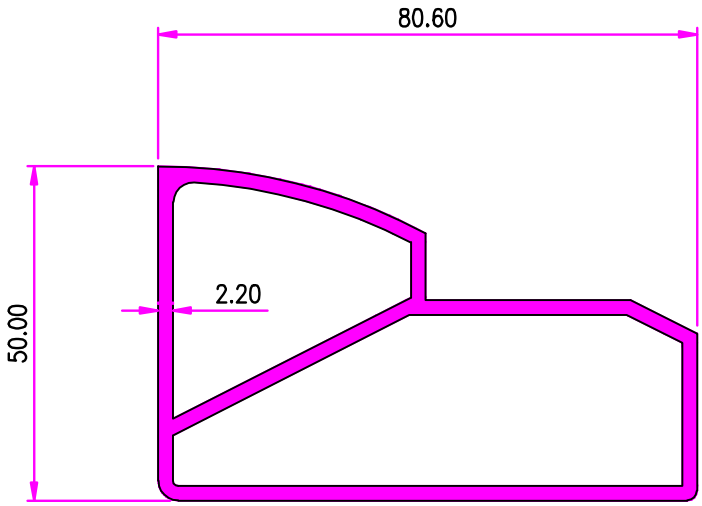
TEXTILE SECTIONS **GROUP : 18J-2**



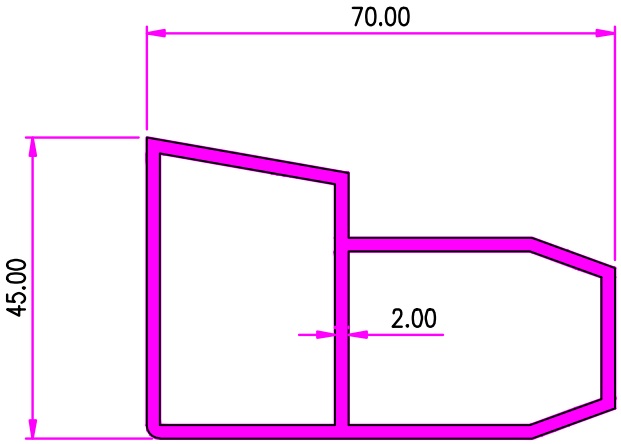




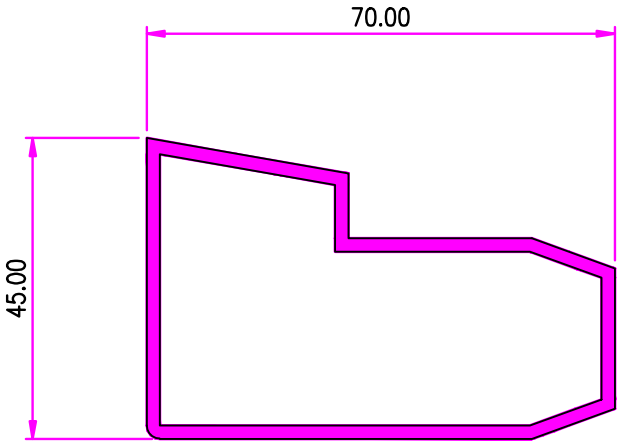
TEXTILE SECTIONS **GROUP : 18J-3**



DIE 7614
W : 1.673 KG/M
P : 246.97 MM

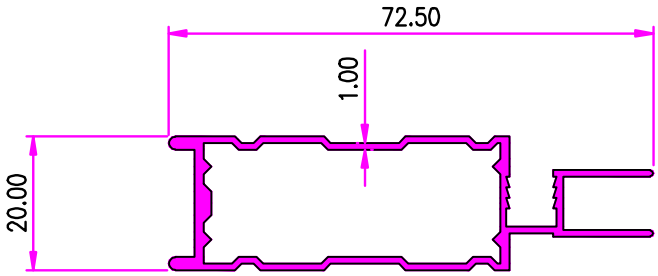


DIE 7625
W : 1.278 KG/M
P : 215.53 MM



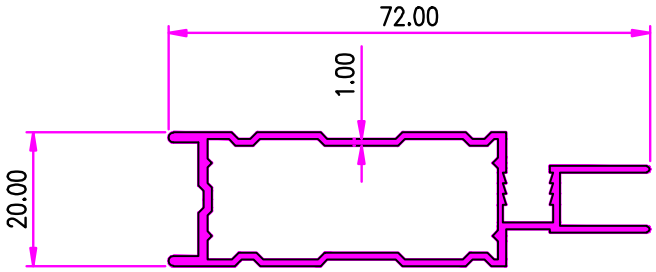
DIE 8269
W : 1.136 KG/M
P : 215.53 MM

AMPLIMESH SECTIONS **GROUP : 18K-1**



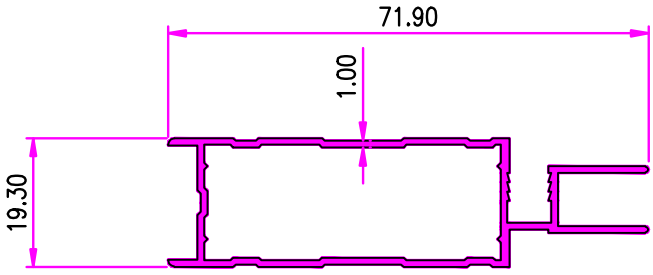
DIE 9241

W : 0.595 KG/M
P : 245.97 MM



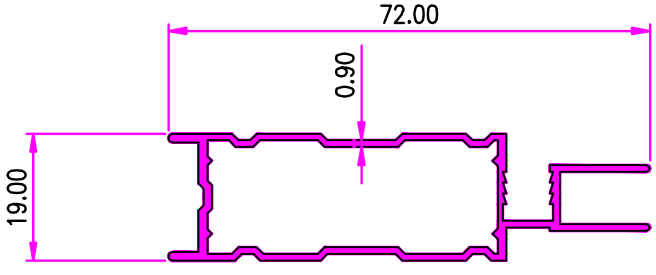
DIE 9241R

W : 0.547 KG/M
P : 247.14 MM



DIE 9567

W : 0.506 KG/M
P : 240.78 MM

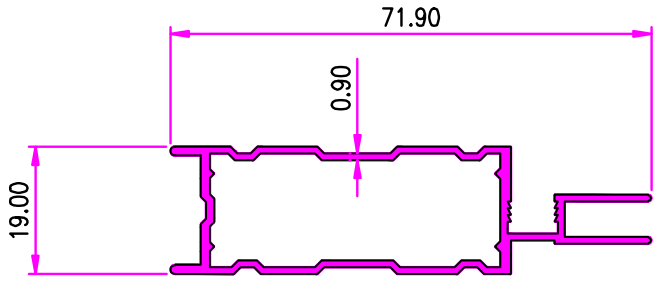


DIE 9581

W : 0.488 KG/M
P : 245.24 MM

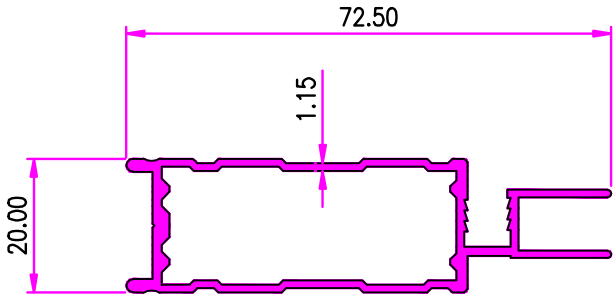
AMPLIMESH SECTIONS

GROUP : 18K-2



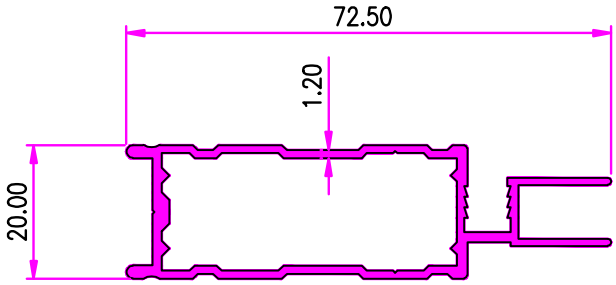
DIE 9582

W : 0.481 KG/M
P : 237.16 MM



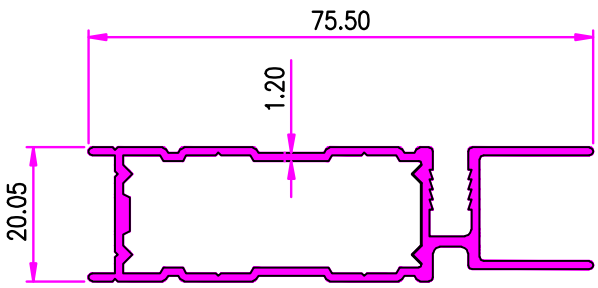
DIE 7597

W : 0.654 KG/M
P : 243.97 MM



DIE 7603

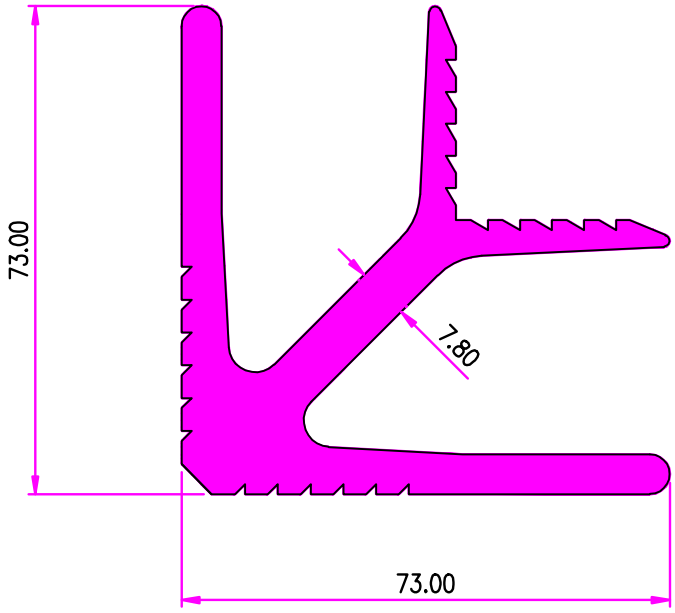
W : 0.658 KG/M
P : 244.46 MM



DIE 7626

W : 0.723 KG/M
P : 274.29 MM

AMPLIMESH SECTIONS **GROUP : 18K-3**



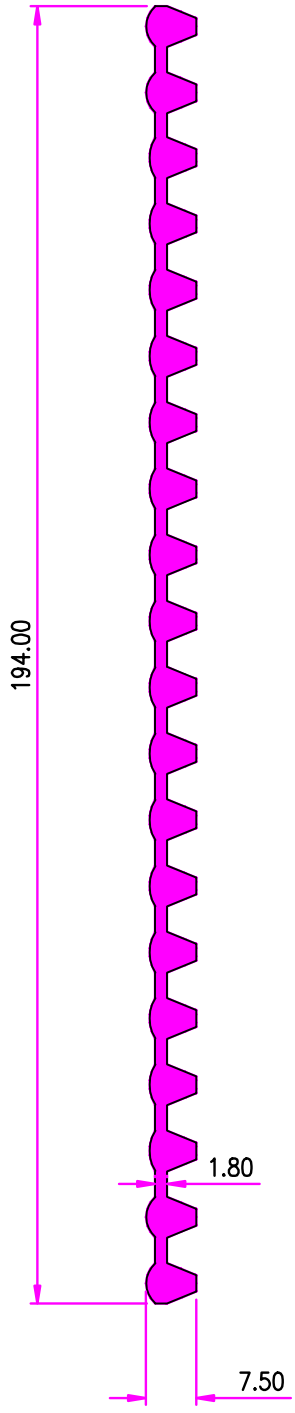
DIE 7075

W : 4.213 KG/M

P : 500.50 MM

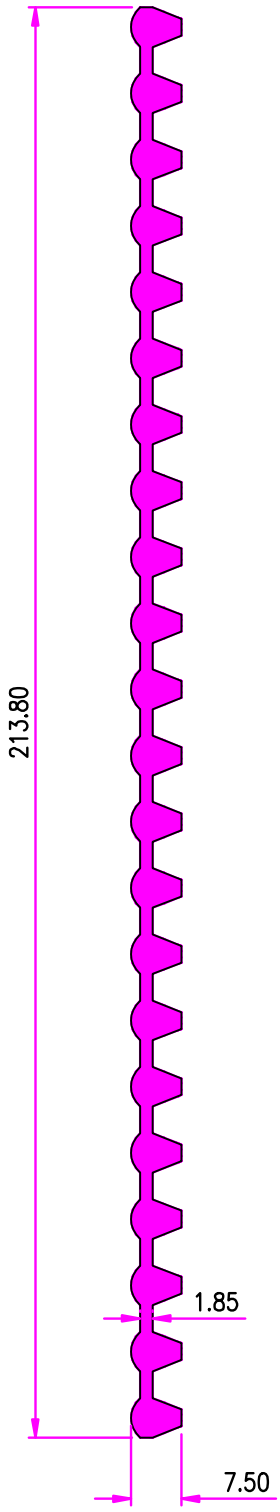
PT.ALEXINDO
(Aluminium Extrusions Indonesia)

MESH SECTIONS **GROUP : 18K-4**



DIE 362

W : 2.054 KG/M
P : 494.42 MM



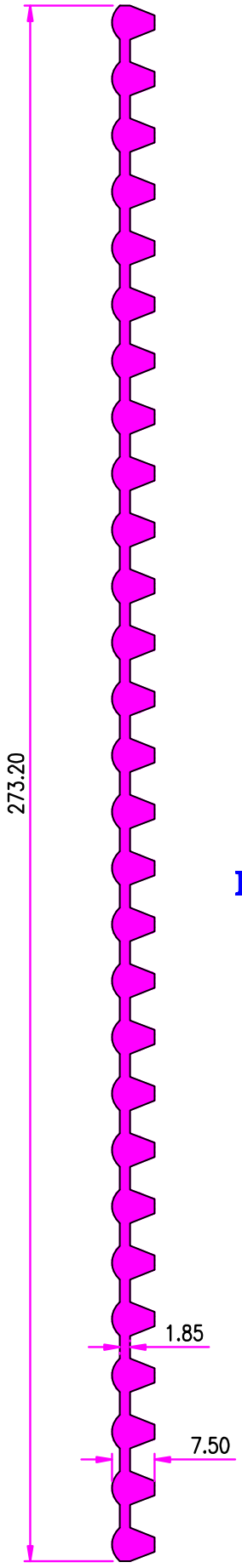
DIE 480

W : 2.272 KG/M
P : 552.31 MM

PT.ALEXINDO

(Aluminium Extrusions Indonesia)

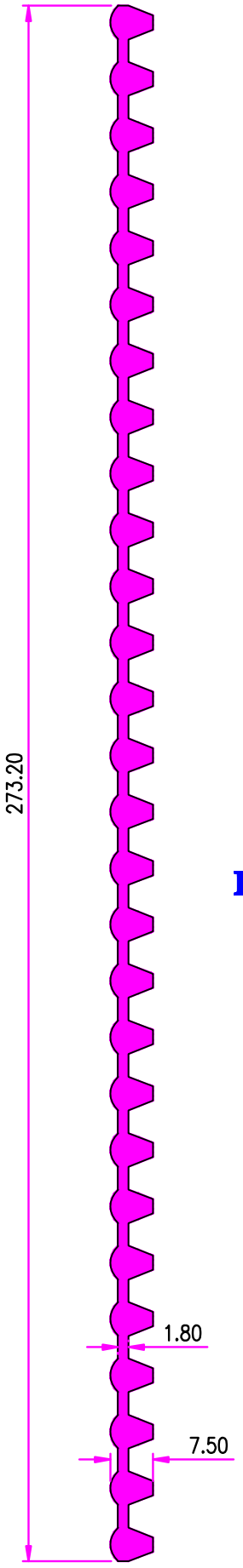
MESH SECTIONS **GROUP : 18K-5**



DIE 361

W : 3.325 KG/M

P : 736.10 MM



DIE 506

W : 2.844 KG/M

P : 692.93 MM

wavin

Dimana air mengalir sampai jauh

PANDUAN TEKNIK & KATALOG PRODUK



WAVIN STANDARD

Aplikasi
Pipa Air Bersih Bertekanan
dan Buangan



Pendahuluan	01
Keunggulan dan Manfaat	02
Physical Properties	02
Standar Kualitas	02
Aplikasi Sistem	03
Jenjang Produk	03
Kelas AW	03
Kelas D	04
Fitting JIS K-6743	05
Fitting JIS K-6739	11
Transportasi dan Penyimpanan	18
Proses Penyambungan	20
Referensi Proyek	21







WAVIN STANDARD

WAVIN GROUP

Wavin adalah salah satu grup perusahaan produsen sistem perpipaan plastik terlengkap dan terbesar di Eropa. Saat ini Wavin telah beroperasi di lebih dari 40 negara di dunia terutama di Eropa dan juga mempunyai saham pada beberapa perusahaan plastik besar di Australia, Singapura dan Selandia Baru.

Wavin telah memproduksi dan menyuplai pipa plastik sejak tahun 1955 dengan menempatkan teknologi dan inovasi yang berkesinambungan sehingga Wavin selalu selangkah lebih maju daripada para pesaingnya. Hal ini terbukti dari hasil survey konsultan internasional *"European Plastic News"* pada jurnalnya menyebutkan bahwa Wavin merupakan kontributor utama dalam pengembangan pipa plastik dan juga sebagai pemimpin dalam pemasaran pipa plastik dan pengembangan teknologi.

WAVIN DUTA JAYA

PT. Wavin Duta Jaya telah berdiri sejak tahun 1973. Seluruh kegiatannya di bawah pengawasan/lisensi dari Wavin BV, Holland. Dengan pengalaman lebih dari 30 tahun dalam memproduksi dan memasarkan pipa plastik seperti Wavin Standard, Wavin Lite, Wavin Black, Wavinsafe & Wavinlok, Wavin Tigris Green dan Wavin AS serta pipa dan fitting merek Rucika membuat PT. Wavin Duta Jaya merupakan salah satu perusahaan pipa plastik yang terlengkap dan terinovatif di Indonesia.

WAVIN STANDARD terbuat dari bahan **uPVC (*unplastized Polyvinyl Chloride*)** yang banyak sekali kelebihannya dibanding material polimer lainnya, seperti : tahan terhadap korosi, kuat, ringan, mudah dalam penyambungan dan pemeliharaan.

Keunggulan dan Manfaat

- Kualitas Internasional
  Di bawah pengawasan/lisensi Wavin, BV. Holland.
- Kuat dan Tidak Mudah Pecah
  Mengandung resin uPVC dan aditif.
- Menggunakan Aditif Khusus
  Dapat mereduksi pengaruh UV (Ultra Violet) terhadap pipa dalam jangka waktu yang lama.
- Tahan terhadap bahan kimia ekstrim
- Dapat digunakan untuk berbagai jenis sistem air bersih dan air buangan
- Terbuat dari uPVC yang bersifat *thermoplastic* sehingga dapat didaur ulang
- Memiliki Beraneka Ragam Fitting / Sambungan
  Menjamin instalasi terpasang dalam satu sistem.
- Tahan Lama
  Tidak dapat berkarat dan bebas pemeliharaan.
- Termasuk Isolator yang Baik dan Tidak Dapat Menimbulkan Api
  Dapat digunakan untuk selubung kabel listrik.

Physical Properties

Property	Unit	Value
Specific gravity	g/cm^3	1,40
Coefficient of linear expansion	$mm/m.^{\circ}K$	8×10^{-2}
Thermal conductivity	$W/m.^{\circ}K$	0,15
Modulus of elasticity	N/mm^2	3000
Surface resistance	Ohm	$> 10^{12}$

Standar Kualitas

WAVIN STANDARD diproduksi di pabrik dengan sertifikasi ISO 9001:2000 dan produknya memenuhi standar JIS dan ISO.

Aplikasi Sistem

WAVIN STANDARD diproduksi untuk berbagai kebutuhan seperti:

- Saluran air bersih
- Saluran pembuangan
- Saluran limbah
- Saluran Irigasi
- Pipa ventilasi

Jenjang Produk

WAVIN STANDARD dapat diklasifikasikan menjadi 2 (dua) kelompok:

1. Kelas AW, untuk air bertekanan tinggi sampai tekanan kerja 10 kg/cm^2 dengan 14 macam ukuran diameter dari 1/2 inch sampai 12 inch.
2. Kelas D, untuk saluran pembuangan dan limbah dengan 11 macam ukuran diameter dari 1 1/4 inch sampai 12 inch.
   Kedua kelompok tersebut tersedia dalam panjang standar sampai 4 meter.

KELAS AW

Diameter		Tebal Dinding (mm)	Panjang (m)	Sistem Penyambungan	Kode Produk
inch	mm				
1/2	22	1,50	4	SC	210022001
3/4	26	1,80	4	SC	210026001
1	32	2,00	4	SC	210032001
1 1/4	42	2,30	4	SC	210042001
1 1/2	48	2,30	4	SC	210048001
2	60	2,30	4	SC	210060001
2 1/2	76	2,60	4	SC	210076001
3	89	3,10	4	SC	210089001
4	114	4,10	4	SC	210114001
5	140	5,40	4	SC	210140001
6	165	6,40	4	SC	210165001
8	216	8,30	4	SC	210216001
10	267	10,30	4	SC	210267001
12	318	12,20	4	SC	210318001

KELAS D

Diameter		Tebal Dinding (mm)	Panjang (m)	Sistem Penyambungan	Kode Produk
inch	mm				
1 1/4	42	1,30	4	SC	510042001
1 1/2	48	1,30	4	SC	510048001
2	60	1,30	4	SC	510060001
2 1/2	76	1,40	4	SC	510076001
3	89	1,60	4	SC	510089001
4	114	2,00	4	SC	510114001
5	140	2,60	4	SC	510140001
6	165	3,00	4	SC	510165001
8	216	4,20	4	SC	510216001
10	267	5,20	4	SC	510267001
12	318	6,20	4	SC	510318001

SC : Solvent Cement (Penyambungan dengan Lem)



FITTING & PIPA PVC

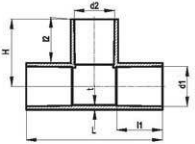
RUCIKA®

KUAT • MENYATU • TAHAN LAMA

FITTING UNTUK AIR BERSIH BERTEKANAN
JIS K-6743

TEE (AW)

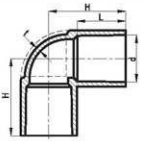




Ukuran Produk	d1	I1	d2	I2	H	L	t (min)	Kode Produk
1/2"	Ø22.4	30	Ø22.4	30	43	86	3.3	2241000220
3/4"	Ø26.5	35	Ø26.5	35	50	100	3.3	2241000260
1"	Ø32.5	40	Ø32.5	40	58	116	3.8	2241000320
1 1/4"	Ø42.6	44	Ø42.6	44	69	138	4.2	2241000420
1 1/2"	Ø48.7	55	Ø48.7	55	82	164	4.2	2241000480
2"	Ø60.8	63	Ø60.8	63	96	192	4.6	2241000600
2 1/2"	Ø76.6	61	Ø76.6	61	110	220	5.2	2241000760
3"	Ø89.6	64	Ø89.6	64	120	240	6.2	2241000890
4"	Ø114.7	84	Ø114.7	84	151	302	8.7	2241001140
6"	Ø166	132	Ø166	132	230	460	10.0	2241001650
8"	Ø217	145	Ø217	145	256	512	9.5	2241002160
3/4"x1/2"	Ø26.45	35	Ø22.4	30	48	96	3.3	2241000250
1"x1/2"	Ø32.5	40	Ø22.4	30	52	106	3.8	2241000300
1 x 3/4"	Ø32.5	40	Ø26.5	35	55	110	3.8	2241000310
1 1/4" x 1"	Ø42.6	44	Ø32.5	40	62	124	4.2	2241000410
1 1/2" x 1 1/4"	Ø48.7	55	Ø42.6	44	77	154	4.2	2241000470
2"x1"	Ø60.8	63	Ø32.5	40	81	162	4.6	2241000570
3" x 2"	Ø89.6	64	Ø60.8	63	105	210	6.2	2241000870

ELBOW (AW)

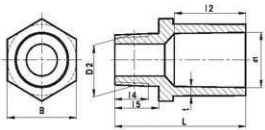




Ukuran Produk	d	L	H	t (min)	Kode Produk
1/2"	Ø22.4	30	43	3.5	223 000220
3/4"	Ø26.5	35	50	3.5	223 000260
1"	Ø32.5	40	58	4.0	223 000320
11/4"	Ø42.6	44	70	4.5	223 000420
11/2"	Ø48.7	55	82	4.5	223 000480
2"	Ø60.8	63	96	5.0	223 000600
2 1/2"	Ø 76.6	61	110	5.6	223 000760
3"	Ø89.6	64	120	8.0	223 000890
4"	Ø114.7	84	153	10.0	223 001140
5"	Ø140.9	104	187.1	11.0	223 001400
6"	Ø166	132	230.1	13.0	223 001650
8"	Ø217	145	284.6	10.0	223 002160
10"	Ø269	155	324.9	10.0	223 002670

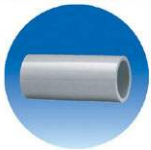
VALVE SOCKET (AW)

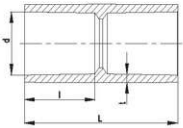




Ukuran Produk	d1	D2	l2	l4	l5	L	B	t (min)	Kode Produk
1/2"	Ø22.4	PT 1/2"	30	15	18.5	55	29	3.3	221 100220
3/4"	Ø26.5	PT 3/4"	35	17	20.5	64	33	3.3	221 100260
1"	Ø32.5	PT 1"	40	19	23	71	40	3.8	221 100320
1 1/4"	Ø42.6	PT 1 1/4"	45	22	26	80	51	3.7	221 100420
1 1/2"	Ø48.7	PT 1 1/2"	55	22	27	92	57.5	4.2	221 100480
2"	Ø60.8	PT 2"	63	26	31	106	70.5	4.6	221 100600
1" x 1/2"	Ø22.4	PT 1"	30	15	23	71	40	3.3	221 100300
1" x 3/4"	Ø26.5	PT 1"	35	17	23	71	40	3.3	221 100310

SOCKET (AW)

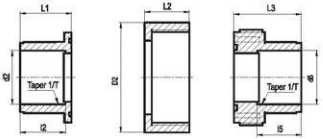




Ukuran Produk	d	L	l	t (min)	Kode Produk
1/2"	Ø22.4	67	30	3.3	221 000220
3/4"	Ø26.5	77	35	3.2	221 000260
1"	Ø32.6	87	40	3.7	221 000320
11/4"	Ø42.6	95	44	4.2	221 000420
11/2"	Ø48.7	117	55	4.1	221 000480
2"	Ø60.8	133	63	4.6	221 000600
3"	Ø89.6	155	64	6.2	221 000890
4"	Ø114.7	200	84	7.6	221 001140
6"	Ø166	300	132	10.0	221 001650
8"	Ø217	360	145	10.5	221 002160
10"	Ø269	389	155	12.2	221 002670

UNION SOCKET (AW)

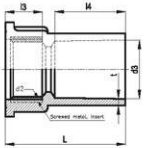




Ukuran Produk	d2	L1	l2	D2	L2	d5	L3	l5	1/T	Kode Produk
1/2"	Ø22.4	25	21	Ø50	25.5	Ø22.4	32.5	21.5	1/34	911 240225
3/4"	Ø26.45	28.6	25	Ø59	27.4	Ø26.45	34.5	24.5	1/34	911 240265
1"	Ø32.55	30.4	26.5	Ø67.3	27.2	Ø32.55	39.5	26.5	1/34	911 240325
1 1/4"	Ø42.6	36.5	32	Ø78.4	34.4	Ø42.6	49.7	31.5	1/34	911 240425
1 1/2"	Ø48.7	43	37.5	Ø91.7	37.7	Ø48.7	56	38.5	1/37	911 240485

FAUCET SOCKET (AW)



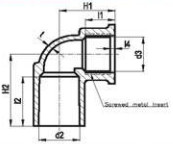


Ukuran Produk	d2	d3	l3	l4	L	t (min)	Kode Produk
1/2"*	PT 1/2"	ø22.4	17	30	52	3.3	221 110220 221 280220*
3/4"*	PT 3/4"	ø26.45	19	35	59	3.3	221 110260 221 280260*
1"	PT 1"	ø32.55	21	40	68	3.7	221 110320
1 1/4"	PT 1 1/4"	ø42.6	27	44	80	4.2	221 110420
1 1/2"	PT 1 1/2"	ø48.7	27	55	91	4.2	221 110480
2"	PT 2"	ø60.8	32.5	63	107	4.6	221 110600
1" x 1/2"	PT 1"	ø22.4	21	30	61.8	4.8	221 110300
1" x 3/4"	PT 1"	ø26.45	21	35	66.8	3.3	221 110310

* Tersedia dalam *metal insert*

FAUCET ELBOW (AW)



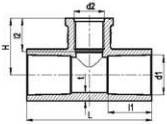


Ukuran Produk	l1	H1	d2	l2	H2	d3	l4	t (min)	Kode Produk
1/2"*	17	32	ø22.4	30	43	PT 1/2	3	3.3	2231090220 2231110220*
3/4"*	19	36	ø26.5	35	51	P/T 3/4	3	3.2	2231090250 2231110250*

* Tersedia dalam *metal insert*

FAUCET TEE (AW)

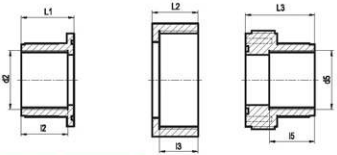




Ukuran	d1	l1	d2	l2	L	H	t (min)	Kode Produk
1/2"	ø22.4	30	PT 1/2"	19	86	32	3	2241090220

UNION THREAD (AW)

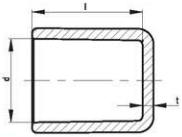




Ukuran Produk	d2	L1	l1	L2	l3	d5	L3	l5	Kode Produk
1/2"	PT 1/2 "	25	21.5	25.5	20.4	PT 1/2 "	32.5	18	911 250225
3/4"	PT 3/4 "	28.6	23	27.4	22.5	PT 3/4 "	34.5	21	911 250265
1"	PT 1 "	30.4	18.6	27.2	22.3	PT 1 "	39.5	26	911 250325
1 1/4"	PT 11/4"	36.5	31.4	34.4	32	PT 11/4"	49.7	31.5	911 250425
1 1/2"	PT 11/2"	43	36.6	37.7	32.5	PT 11/2"	56	37	911 250485

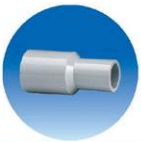
CAP (AW)

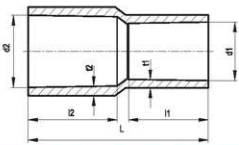




Ukuran Produk	d	l	t (min)	Kode Produk
1/2"	Ø 22.4	30	3.5	911 250225
3/4"	Ø 26.5	35	3.5	911 250265
1"	Ø 32.6	40	40	911 250325
6"	Ø 166.0	132	8.5	911 250425
8"	Ø 217.0	145	10.4	911 250485

REDUCING SOCKET (AW)

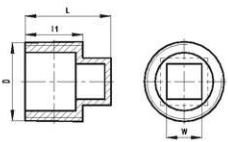




Ukuran Produk	d1	d2	L	l1	l2	t1 (min)	t2 (min)	Kode Produk
3/4" x 1/2"	22.4	26.45	74	30	35	3.3	3.3	222 000280
1" x 1/2"	22.4	32.55	84	30	40	3.3	3.7	222 000310
1" x 3/4"	26.5	32.55	85	35	40	3.3	3.7	222 000320
1 1/4" x 1/2"	22.4	42.6	99	30	44	3.3	4.2	222 000400
1 1/4" x 3/4"	26.45	42.6	93	35	44	3.3	4.2	222 000410
1 1/4" x 1"	32.55	42.6	94	40	44	3.7	4.2	222 000420
1 1/2" x 1/2"	22.4	48.7	110	30	55	3.3	4.2	222 000450
1 1/2" x 3/4"	26.45	48.7	116	35	55	3.3	4.2	222 000460
1 1/2 x 1"	32.5	48.7	114	40	55	3.8	4.2	222 000470
1 1/2" x 1 1/4"	42.6	48.7	115	44	55	3.2	4.2	222 000480
2" x 1"	32.5	60.8	140	40	63	3.8	4.6	222 000580
2" x 1 1/4"	42.6	60.8	125	44	63	3.2	4.6	222 000590
2" x 1 1/2"	48.7	60.8	136	55	63	4.2	4.6	222 000600
3" x 2"	60.8	89.6	165	63	64	4.2	6.2	222 000880
4" x 1 1/2"	48.7	114.7	199	55	84	4.2	7.7	222 001110
4" x 2"	60.8	114.7	182	63	84	4.6	7.7	222 001120
4" x 3"	89.6	114.7	190	64	84	6.2	7.7	222 001140
6" x 3"	89.6	166	275	64	132	6.2	10.0	222 001610
6" x 4"	114.7	166	295	84	132	7.7	10.0	222 001630
6" x 5"	140.85	166	272	104	132	8.1	10.0	222 001650
8" x 4"	114.7	217	340	50	145	4.7	5.0	222 002100
8" x 5"	140.85	217	345	104	145	8.1	10.5	222 002120
8" x 6"	166	217	350	132	145	10.0	10.5	222 002140
10" x 8"	217	269	420	145	155	10.5	12.2	222 002670

PLUG (AW)

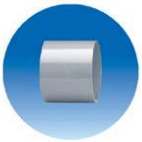


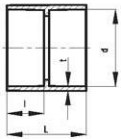


Ukuran Produk	D	l1	L	W	Kode Produk
1/2"	PT 1/2"	16.6	25.5	12.5	225 110225
3/4"	PT 3/4"	18.7	28	15.5	225 110265

FITTING UNTUK AIR BUANGAN DAN LIMBAH
JIS K-6739

SOCKET (D-DS)

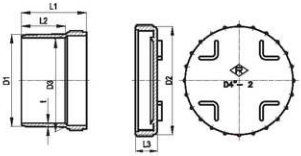




Ukuran Produk	d	L	l	t (min)	Kode Produk
11/4"	Ø42.25	43	20	2.9	521 000420
11/2"	Ø48.30	47	22	2.9	521 000480
2"	Ø60.35	53	25	3.3	521 000600
21/2"	Ø76.4	73	35	3.3	521 000760
3"	Ø89.45	84	40	3.8	521 000890
4"	Ø114.55	104	50	4.7	521 001140
5"	Ø140.7	134	65	5.2	521 001400
6"	Ø165.85	164	80	6.1	521 001650
8"	Ø217.3	215	105	4.8	521 002160

CLEAN OUT CAP (D-CO)

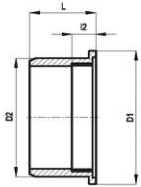


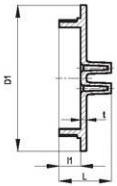


Ukuran Produk	D1	D3	L1	L2	D2	L3	t (min)	Kode Produk
4"	Ø113.6	Ø114	Ø114	Ø113.6	Ø134	27.5	4.5	525 101140

CLEAN OUT (D)







a. Clean Out Socket

Ukuran Produk	D1	D2	l2	L	Kode Produk
3"	Ø 100	Ø 89	18.8	35.8	525 200890
4"	Ø 128	114	24	41	525 201140

b. Clean Out Cap

Ukuran Produk	D1	l1	L	t (min)	Kode Produk
3"	Ø 100	14.8	35.8	4	525 200890
4"	Ø 128	20	41	4	525 201140

INCREASER (D-IN)

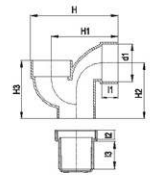




Ukuran Produk	d1	l1	d2	l2	L	t1 (min)	t2 (min)	Kode Produk
2" x 11/4"	60.4	25	42.3	20	65	3.3	2.8	522 000590
2" x 11/2"	60.4.3	25	48.3	22	67	3.3	2.8	522 000600
21/2" x 2"	76.4	35	60.4	25	80	3.3	3.3	522 000760
3" x 2"	89.5	40	60.4	25	90	3.75	3.3	522 000880
3" x 21/2"	89.5	40	76.4	35	100	3.75	3.3	522 000890
4" x 2"	114.5	50	60.4	25	105	4.75	3.3	522 001120
4" x 3"	114.5	50	89.5	40	120	4.75	3.7	522 001140
6" x 3"	165.9	80	89.5	40	161	6.05	3.7	522 001620
6" x 4"	165.9	80	114.5	50	170	6.05	4.7	522 001630
6" x 5"	165.9	80	140.7	65	185	6.05	5.1	522 001650
8" x 4"	217.3	105	114.5	50	225	4.85	4.7	522 002100
8" x 6"	217.3	105	165.9	80	252	4.85	6.0	522 002140

P-TRAP (D)

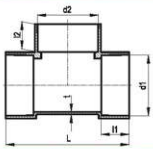




Ukuran Produk	d1	i1	H1	H2	H3	I2	I3	H	Kode Produk
2"	Ø60.4	25	108.7	90.5	94	15	45	142	526 100600

TEE (D-DT)

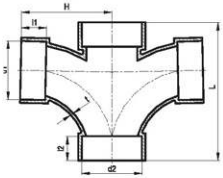




Ukuran Produk	d1	I1	d2	L	I2	t (min)	Kode Produk
11/4"	42.3	20	Ø42.3	88	20	2.8	5241000420
11/2"	48.3	22	Ø48.3	98	22	2.8	5241000480
2"	60.4	25	Ø60.4	118	25	3.3	5241000600
21/2"	76.4	35	Ø76.4	155	35	3.3	5241000760
3"	89.5	40	Ø89.5	176	40	3.7	5241000890
4"	114.5	50	Ø114.5	224	50	4.7	5241001140
6"	165.9	80	Ø165.9	338	80	6.0	5241001650
8"	217.3	105	Ø217.3	440	105	4.8	5241002160
3" x 2"	89.5	40	Ø60.35	147	25	3.7	5241000870
4" x 2"	114.5	50	Ø60.35	171	25	4.7	5241001120
4" x 3"	114.5	50	Ø89.45	200	40	4.7	5241001130
5" x 4"	140.7	65	Ø114.5	252	50	5.1	5241001390

LARGE RADIUS DOUBLE TEE (D-WLT)

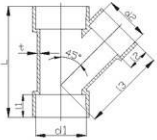




Ukuran Produk	d1	l1	d2	l2	L	H	t (min)	Kode Produk
2"	Ø60.4	25	Ø60.4	25	142	91	3.3	5241970600
3" x 2"	Ø60.4	25	Ø89.5	40	175	104	3.3	5241970870
4"	Ø114.6	50	Ø114.6	50	273	178	4.7	5241971140

Y BRANCH (D-Y)

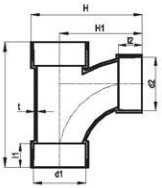




Ukuran Produk	d1	l1	d2	l2	l3	L	t (min)	Kode Produk
1 1/2" x 1 1/4"	Ø48.3	22	42.3	20	79	106	2.8	5241100470
1 1/2" x 1 1/2"	Ø48.3	22	48.3	22	84	114	2.8	5241100480
2" x 1 1/4"	Ø60.4	25	42.3	20	87	114	2.8	5241100580
2" x 2"	Ø60.4	25	60.4	25	103	142	3.3	5241100600
3" x 2"	Ø89.5	40	60.4	25	123	169	3.3	5241100870
3" x 3"	Ø89.5	40	89.5	40	155	210	3.7	5241100890
4" x 2"	Ø114.6	50	60.4	25	143	190	3.3	5241101110
4" x 3"	Ø114.6	50	89.5	40	172	237	3.7	5241101130
4" x 4"	Ø114.6	50	114.6	50	194	266	4.7	5241101140
5" x 4"	Ø140.7	65	114.6	50	222	300	4.7	5241101390

LARGE RADIUS TEE (D-LT)

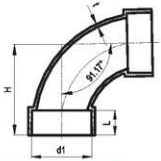




Ukuran Produk	d1	l1	d2	l2	L	H1	H	t (min)	Kode Produk
11/2"x11/4"	Ø48.3	22	Ø42.3	20	106	61	88	2.8	5241800470
11/2"x11/2"	Ø48.3	22	Ø48.3	22	119	74	101	2.8	5241800480
2" x 11/2"	Ø60.4	25	Ø48.3	22	125	79	112.5	3.3	5241800590
2" x 2"	Ø60.4	25	Ø60.4	25	142	91	124.5	3.3	5241800600
21/2"x11/2"	Ø76.4	35	Ø48.3	22	146	88	129.5	3.3	5241800740
21/2" x 2"	Ø76.4	35	Ø60.4	25	163	99	140.5	3.3	5241800750
21/2"x 21/2"	Ø76.4	35	Ø76.4	35	193	125	166.5	3.3	5241800760
3" x 2"	Ø89.5	40	Ø60.4	25	175	104	152.5	3.7	5241800870
3" x 21/2"	Ø89.5	40	Ø76.4	35	202	130	178.5	3.7	5241800880
3" x 3"	Ø89.5	40	Ø89.5	40	210	140	188.5	3.7	5241800890
4" x 2"	Ø114.6	50	Ø60.4	25	198	115	177	4.7	5241801110
4" x 3"	Ø114.6	50	Ø89.5	25	233	150	212	4.7	5241801130
4" x 4"	Ø114.6	50	Ø114.6	50	273	178	240	4.7	5241801140
5" x 4"	Ø140.7	65	Ø114.6	50	310	190	265.5	5.1	5241801390
6" x 6"	Ø165.9	80	Ø165.9	80	395	250	339	6.0	5241801650

LARGE RADIUS ELBOW (D-LL)

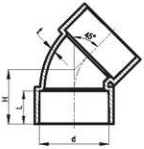




Ukuran Produk	d1	L	H	t (min)	Kode Produk
11/4"	Ø42.3	20	65	2.8	523 800420
2"	Ø60.4	25	91	3.3	523 800600
3"	Ø89.6	40	140	3.7	523 800890
4"	Ø114.5	50	178	4.7	523 801140
5"	Ø140.7	65	205	5.1	523 801400
6"	Ø165.9	80	250	6.0	523 801650

45° ELBOW (D-45L)

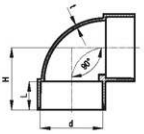




Ukuran Produk	d	L	H	t (min)	Kode Produk
11/4"	42.3	20	33	2.9	523 000400
11/2"	48.3	22	36	2.9	523 000460
2"	60.4	25	43	3.3	523 000580
21/2"	76.4	35	57	3.3	523 000740
3"	89.5	40	65	3.8	523 000870
4"	114.6	50	80	4.7	523 001120
6"	165.9	80	124	6.1	523 001630
8"	217.3	105	161	4.8	523 002140
10"	268.6	125	193	5.7	523 002650
12"	319.8	140	218	6.6	523 003160

ELBOW (D-DL)





Ukuran Produk	d	L	H	t (min)	Kode Produk
11/4"	42.3	20	44	2.8	523 000420
11/2"	48.3	22	49	2.8	523 000480
2"	60.4	25	58	3.3	523 000600
21/2"	76.4	35	77	3.3	523 000780
3"	89.5	40	88	3.7	523 000890
4"	114.5	50	112	4.7	523 001140
5"	140.7	65	140	5.1	523 001400
6"	165.9	80	168	6.0	523 001650
8"	217.39	105	225	4.8	523 002160
10"	268.59	125	267	5.7	523 002670
12"	319.8	140	308	6.6	523 003180

TROPICAL GLUE & PVC CLEANER



Jenis	Isi/box
Lem Botol 60 gr	100
Lem Kaleng 400 gr	12
Lem Kaleng + Cleaner @ 400 gr	12 set

Transportasi dan Penyimpanan

Lokasi Penyimpanan

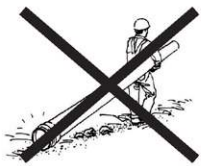
Untuk lokasi penyimpanan dilapangan maupun di gudang perlu di perhatikan beberapa hal, yaitu :

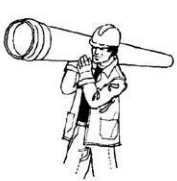
- Harus rata dan memiliki level permukaan yang baik untuk meminimalisasi pergeseran.
- Bebas dari benda tajam yang akan merusak permukaan luar maupun dalam pipa.
- Disediakan ruang gerak untuk orang dan forklift/*pallet truck*, sehingga memudahkan dalam penanganan dan trasportasi.
- Jauh dari sumber panas yang akan mengakibatkan deformasi.
- Jauh dari lokasi penyimpanan oli, lem maupun zat lain yang akan mengakibatkan kerusakan.

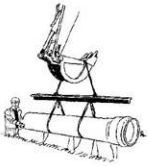


Penanganan/Handling

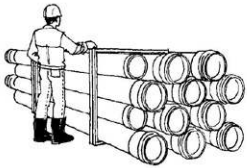
Ketika WAVIN STANDARD akan dilakukan penanganan secara manual/individu, maka penanganan pipa harus dilakukan dengan hati-hati, jangan di lempar, dibanting maupun diseret.







Penyimpanan





- Untuk mempermudah pengenalan maka sebaiknya penyusunan berdasarkan kelompok akan sangat membantu.
- Tinggi maksimum penyusunan adalah 1,5 meter.
- Lebar maksimum penyusunan adalah 3 meter.
- Sebagai penunjang landasan diberikan landasan dengan tinggi rata-rata 75 mm dengan jarak antara penyangga 1,5 meter.
- Sebagai penunjang samping untuk pengelompokan dan mencegah pergeseran pipa, maka dibuat penyangga yang kuat dengan tinggi + 2 meter dengan jarak antara penyangga 1,5 meter.
- Radiasi ultra-violet secara langsung dalam jangka waktu yang lama perlahan-lahan akan mempengaruhi kekuatan (*impact strength*) dari material uPVC sehingga mengurangi *life time* pipa, untuk itu pipa perlu diiindungi dari radiasi langsung ultra-violet.





- Untuk melindungi socket pipa maka penyusunan pipa biasanya dilakukan dengan memberikan sekat diantara pipa maupun dengan melakukan penyusunan sistem *back to back* atau *crossing*.

Proses Penyambungan

1. Bersihkan kotoran pada permukaan spigot dan socket dengan WAVIN CLEANER.
2. Ukur kedalaman socket dan beri tanda dengan spidol pada spigot.
3. Oleskan secukupnya WAVIN TROPICAL GLUE pada permukaan spigot dan socket.
4. Sambungkan dengan segera dan posisi sambungan ditahan sesaat agar tidak berubah.
5. Bersihkan sisa kelebihan WAVIN TROPICAL GLUE pada permukaan spigot dan socket.











Referensi Proyek

NO	PROYEK	LOKASI
1	The East Apt.	Mega Kuningan
2	The View Apt.	Kemayoran
3	Pacific Palace	SCBD
4	Capitol Residence	SCBD
5	Kota Baru Parahyangan	Bandung
6	Hotel Planet	Bandung
7	Menara BCA	S. Parman
8	Casablanca Mansion	Casablanca
9	Bank NISP	Tanah Abang
10	City Lofts	Kelapa Gading
11	Kantor Serbaguna Sentul	Sentul
12	Grand Indonesia	MH. Thamrin
13	Oakwood Residence	Mega Kuningan
14	Bank Mega	Bandung
15	Paskal Hyper Square	Bandung
16	Toyota Astra Motor	Cibitung
17	Taman Safari	Bali



Grand Indonesia
Jakarta



Apt. The View
Jakarta



PT Wavin Duta Jaya

Alia Building 7th Floor
Jl. M.I. Ridwan Rais 10-18 (Gambir)
Jakarta 10110 INDONESIA
Phone: (+62-21) 386 7717 Fax: (+62-21) 386 7686
E-mail: info@wavin.co.id

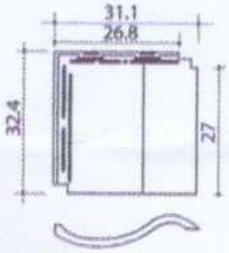
www.wavin.co.id

10/2007



specification

Length / *Panjang*	: 32.4 cm (+/- 0.2 cm)
Width / *Lebar*	: 31.1 cm (+/- 0.2 cm)
Effective Length / *Panjang efektif*	: 27 cm (+/- 0.2 cm)
Effective Width / *Lebar efektif*	: 26.8 cm (+/- 0.2 cm)
Weight per tile / *Berat per unit*	: max 2950gr
Bending Failing Load / *Beban lentur*	: +/- 180Kgf
Quantity /*Jumlah*	: 13.6pcs/m2
Water Absorption / *Penyerapan air*	: max 7%
Batten Distance / *Jarak reng*	: 27 cm

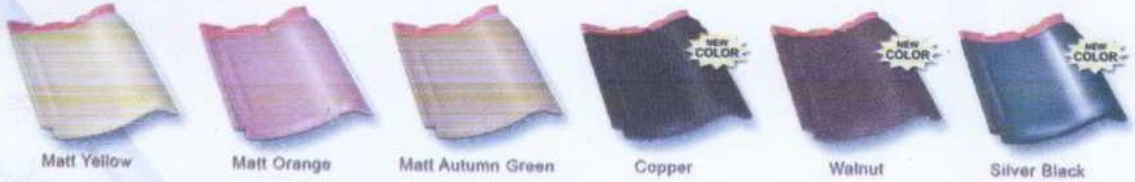


Accessories



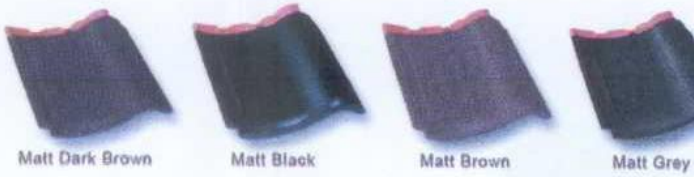
Note: Warna genteng bukan acuan sebenarnya. *Color tiles may not represent the actual color of the product.*

Color





Minimalist Choice



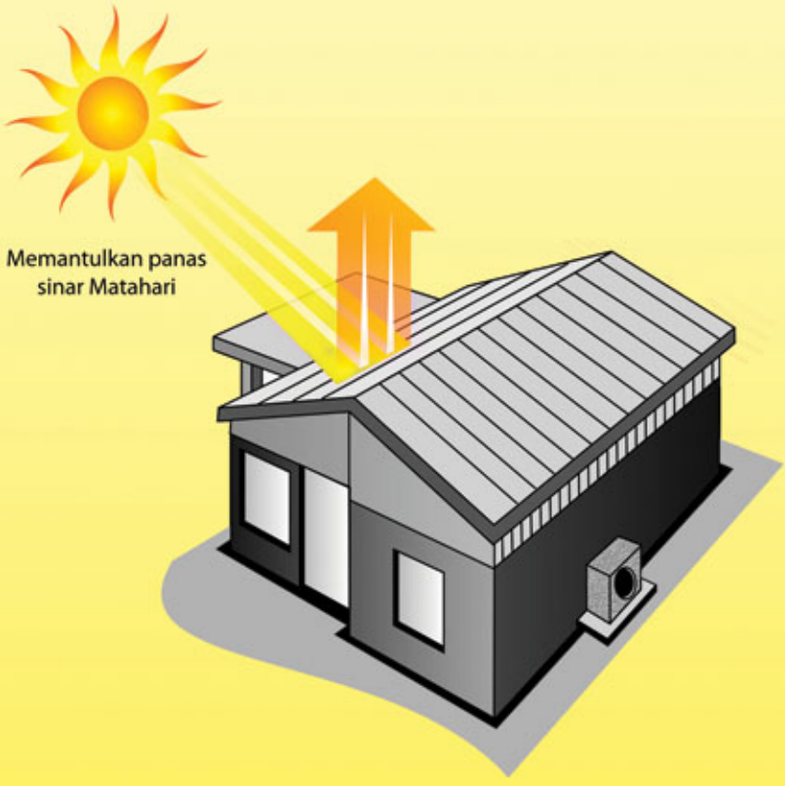
PT M Class Industry

SHINE foil®

Alumunium Paper Insulation

"The Healthy Solution To Energy Efficiency"





www.shinefoil.co.id

Tidak Mudah Sobek

Memantulkan Panas

EASY INSTALLATION

Mudah di Pasang

Tahan Bocor

Mengontrol Kelembaban

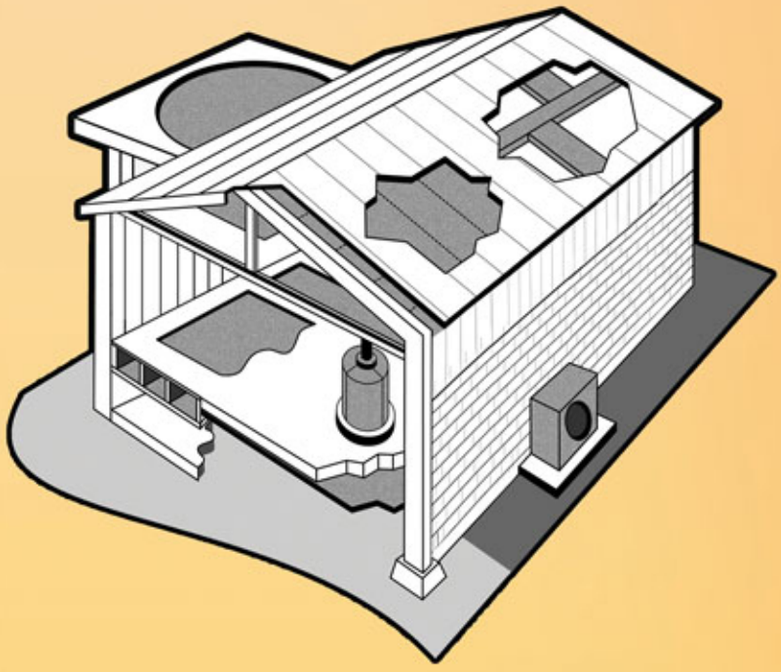
SHINE foil®

Shine Foil Alumunium Paper Insulation adalah alumunium Foil isolasi yang terbuat dari beberapa lapisan material yaitu kertas yang dilapisi aluminium foil serta diperkuat dengan benang Polyester atau benang serat gelas (srim), sehingga memiliki daya rentang yang kuat dan tidak mudah sobek. Dengan teknologi handal tersebut sehingga menghasilkan alumunium foil isolasi yang bermutu tinggi.

Shine Foil Alumunium Paper Insulation dirancang khusus untuk memantulkan radiasi panas matahari hingga 95%, sehingga ruangan dibawah bangunan menjadi sejuk dan nyaman. Sangat cocok untuk mencegah penguapan dan menghindari kebocoran. Dapat dipakai untuk isolasi atap dan dinding.

Shine Foil Alumunium Paper Insulation secara luas dipakai untuk rock wool, glass wool, papan plafon, ducting pendingin, saluran pipa, isolasi dinding, dll.

Area Pemasangan :



SPESIFIKASI FISIK

Keterangan	1	2	3	4
Type	11SS	12SC	12DS	22DC
Berat	11,25 Kg	111,62 Kg	13,50 Kg	13,87 Kg
Berat Dasar	150g/m2	155g/m2	180g/m2	185g/m2
Panjang	1.25m	1.25m	1.25m	1.25m
Lebar	60m	60m	60m	60m
Daya Pantul	95%	95%	95%	95%
Emisi Permukaan	5%	5%	5%	5%

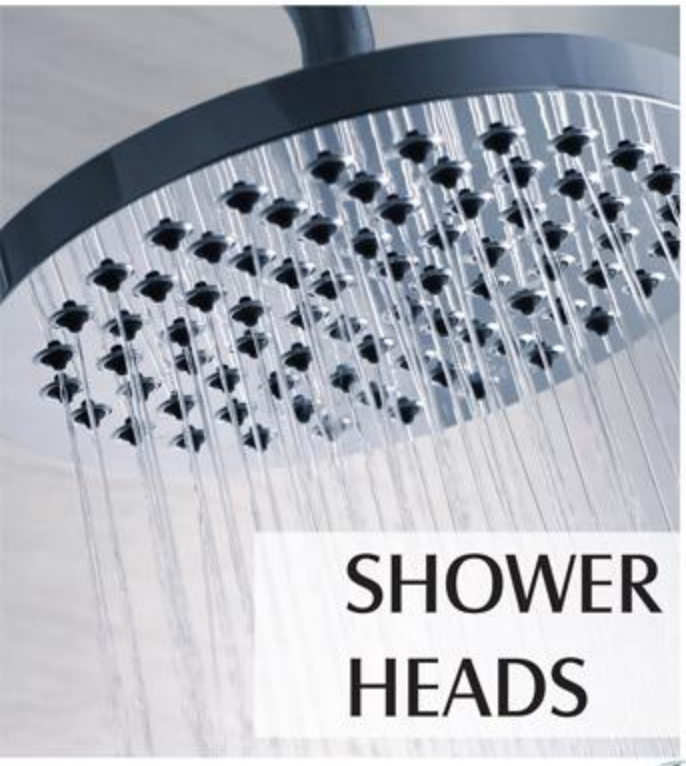
SS : Single Straight SC : Single Cross DS : Double Straight DC : Double Cross

www.shinefoil.co.id

Cap Distributor :

"The Healty Solution To Energy Efficiency"

American Standard





SALE! until Feb. 29, 2016

ECOSENSE
Magnetic Hand Shower w/ Slide Bar
(ES0228K) #236551
SRP: P3,800



SALE! until Feb. 29, 2016

ECOSENSE
Magnetic Hand Shower w/ Slide Bar
(ES0227K) #236550
SRP: P4,800



SALE! until Feb. 29, 2016

HAFELE
Hand Shower Set
#235620
SRP: P900



SALE! until Feb. 29, 2016

ECOSENSE
Rain Shower Pivot
(4F) #205383
SRP: P2,800



SALE! until Feb. 29, 2016

ECOSENSE
Rain Shower
(3F) #205382
SRP: P3,200



SALE! until Feb. 29, 2016

ECOSENSE
Rain Shower
(1F) #205381
SRP: P4,000



SALE! until Feb. 29, 2016

HAFELE
Rain Shower w/ Mount
#235623
SRP: P2,340



AMERICAN STANDARD
ISS In-wall Bath & Shower Mono
#202828
SRP: P2,499



AMERICAN STANDARD
AMM Exposed Bath & Shower Mono
#202831
SRP: P2,399



AMERICAN STANDARD
Saga Exposed Bath & Shower Mixer
#202833
SRP: P6,699



HCG
Hand Shower w/ Faucet & Shower Mono
(LF3010) #210800
SRP: P4,820



HCG
Hand Shower w/ Faucet
(BF0906) #15207
SRP: P9,800



MOEN
Hand Shower w/ Bath Mixer
#35688
SRP: P7,900



MOEN
Hand Shower w/ Bath Mixer
#35686
SRP: P7,200



SHARK
Brass Bath Mixer w/ Hand Shower Set
(1011) #69048
SRP: P2,750





AMERICAN STANDARD
Galaxy II Suite 2 Package
#214170
SRP: P6,499



AMERICAN STANDARD
Codie Plus II Suite 3
#214174
SRP: P20,999



AMERICAN STANDARD
Halo Suite 1
#225741
SRP: P13,999



AMERICAN STANDARD
Halo Suite 3
#214113
SRP: P14,999



AMERICAN STANDARD
Winplus II Dual Flush Suite 1
#214160
SRP: P11,499



AMERICAN STANDARD
Winplus II Dual Flush Suite 2
#214162
SRP: P11,999



48 39 54 113 93 36 104 38
51 69 86 79 120 90 45 56
59 52 77 55 121 46 58 136 NEW
117 53 139 NEW 110 107 81 34 66
118 61 127 NEW 62 73 105 106 35
119 68 141 NEW 108 32 96 109 49
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65 133 NEW 132 NEW 76 44 102 27 70
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91 29 92 83 42 82 63 64
40 31 41 33 87 128 NEW 89 71

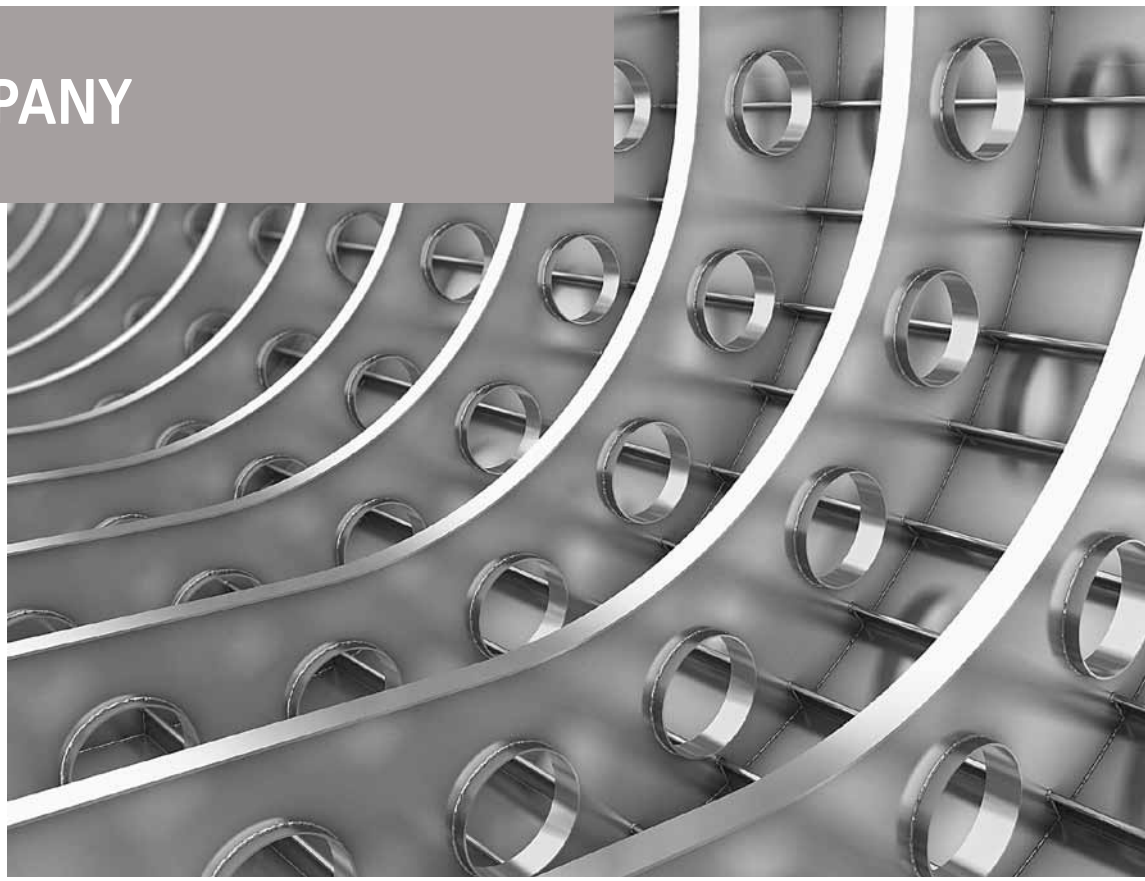


PRODUCT CATALOGUE

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COMPANY



ATT Inox Drain® is the leading producer of stainless steel draining systems.

All our actions are based on the following principles: sustained high quality of products and services, constant improvement and expansion of our range products as well as reliability and timeliness.

We work for Customers in food, chemical, pharmaceutical and wide variety of construction and installation industries.

Through combining innovative projects with advanced technology, modern machine park and years of experience, we offer products and services which meet the highest standards.

Our solutions reflect needs of our Customers, such as on-site adaptation processes during product installation. Each phase of the order completion - from design, through workmanship to installation - is supervised and consulted with you by our specialists, just to make sure you get your final product according to your plans.

ATT is a team of engineers who combine their know--how and passion with creativity and long-standing experience. The combination of these features brings about a certain, unique quality of projects. Their comprehensive technical knowledge of construction and industry realities makes it possible to adjust complex solutions to individual needs of our Customers.

OFFER



WE OFFER

- point and linear drainage systems (floor drains, standard and slot channels, rodding eyes),

- furniture and fittings (tables, closets, cabinets, bathtubs, wash-basins),

- manhole covers, media boxes,

- architectural elements (roofs, finishing elements)

- protective elements (pillars and other protective profiles),

- tailor-made solutions.

STAINLESS STEEL



STAINLESS STEEL



STAINLESS STEEL CHARACTERISTICS

The term "stainless steel" is applied to the steel grades with enhanced corrosion resistance in comparison to normal alloy steels.

The stainless steels are iron alloys containing minimum 11% of chromium. Excellent anticorrosion properties are owed to surface layer of chromium oxides, which is very durable.

The anticorrosion properties are maintained in case of mechanical or chemical damage to the steel surface.

TYPES OF STAINLESS STEEL

Austenitic - it has very good anticorrosion properties with carbon content of approximately 0.02%. It is used in the food processing, chemical and pharmaceutical industries.

Martensitic - posses the highest mechanical strength of all steel types. It Is heat treatable, it has magnetic properties and high carbon content (about 0.3%).

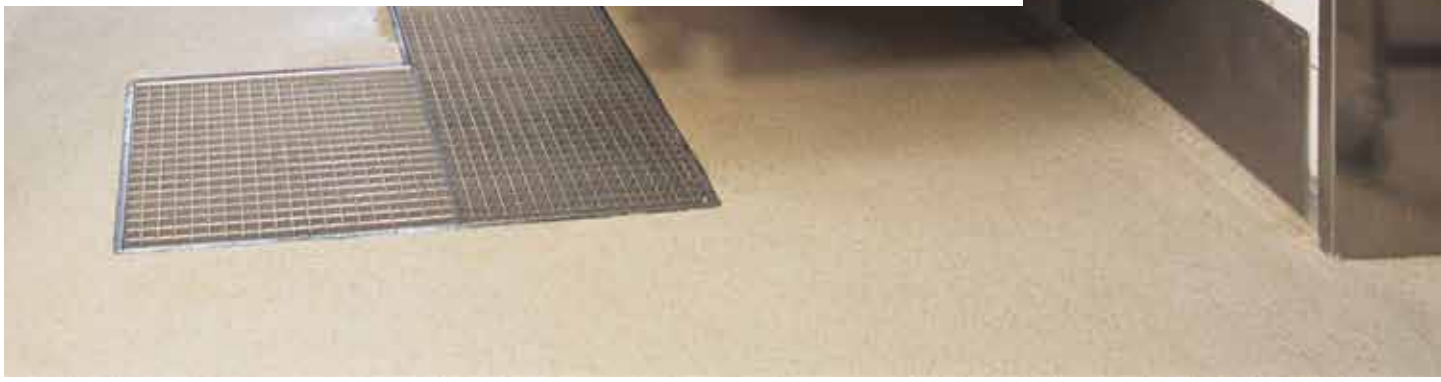
Austenitic-ferritic - this type of steel is smelted in the duplex process. This type of steel has good anticorrosion properties and high crack resistance. It is however magnetic steel, not suitable for plumbing components.

STAINLESS STEEL



RAW MATERIAL

Our basic raw material is stainless steel V2A (austenitic 0H18N9) or V4A. It is also possible to produce elements made of other types of steel. For decorative elements it is possible to order brushed finishing.



STAINLESS STEEL

Below information is developed based on our knowledge and experience and it is indicative. We ensure this information is carefully prepared from technical point of view, however it cannot be treated as the valid standard.

In order to achieve the guarantee of material resistance to a particular factor, laboratory tests need to be held.

MATERIALS' CHEMICAL RESISTANCE

MEDIUM		Temp. C°	STEEL 1.4301 304	STEEL 1.4404 316L
acetic acid		20	< 0,1	< 0,1
acetic acid		20	< 0,1	< 0,1
acetic acid		20	< 0,1	< 0,1
acetic acid		20	< 0,1	< 0,1
acetic acid		boiling p.	< 0,1	< 0,1
acetic acid		20	< 0,1	< 0,1
acetone		20	< 0,1	< 0,1
alcohol (methanol or ethanol)		20	< 0,1	< 0,1
alcohol propyl		20	< 0,1	< 0,1
aluminium chloride		20	< 0,1	< 0,1
aluminum sulphate		20	< 0,1	< 0,1
ammonia		20	< 0,1	< 0,1
ammonia - gas (dry)		20	< 0,1	< 0,1
ammonium hydroxide		20	> 1	> 1
ammonium nitrate	100%	70	< 0,1	< 0,1
ammonium phosphate		20	0,1 - 1	0,1 - 1
ammonium sulfate	20%	boiling p.	0,1 - 1 SP	< 0,1 SP
ammonium sulphide	43%	boiling p.	< 0,1 SP	< 0,1 SP
amonium chloride		20	< 0,1	< 0,1
amonium chloride		20	< 0,1	< 0,1
amonium chloride		20	0,1 - 1	0,1 - 1
amyl chloride		20	> 1	< 0,1
aniline		20	< 0,1	< 0,1
barium chloride		20	0,1 - 1	0,1 - 1
barium hydroxide		20	> 1	> 1
barium sulfate		20	< 0,1	< 0,1
barium sulphide		20	> 1	> 1
beer		20	> 1	> 1
benzene		20	< 0,1	< 0,1
benzoic acid	3%	20-60	0,1 - 1 P	< 0,1 P
bichloride of potassium		20	> 1	0,1 - 1
bleach	20%	20	< 0,1 P	< 0,1 P
boric acid	20%	boiling p.	0,1 - 1 SP	< 0,1 P
bromic acid		20	< 0,1	< 0,1
bromine water		20	0,1 - 1	0,1 - 1
butane		20	< 0,1	< 0,1
calcium carbonate		20	< 0,1	< 0,1
calcium chloride		20	< 0,1	< 0,1
calcium chloride		20	< 0,1	< 0,1
calcium chloride		20	< 0,1	< 0,1
calcium hydroxide		20	< 0,1	< 0,1
calcium hypochlorite		20	< 0,1	< 0,1
calcium sulfate		20	< 0,1	< 0,1
carbon dioxide		20	< 0,1	< 0,1
carbon disulphide		20	< 0,1	< 0,1
carbon monoxide		20	< 0,1	< 0,1
carbon tetrachloride		20	> 1	< 0,1
carbonic acid		20	x	< 0,1
caustic potash		20	< 0,1	< 0,1
caustic soda		20	< 0,1	< 0,1
caustic soda	5%	20	< 0,1	< 0,1

MEDIUM		Temp. C°	STEEL 1.4301 304	STEEL 1.4404 316L
caustic soda	37%	20	< 0,1	< 0,1
chlorinated water		20	0,1 - 1	> 1
chlorinated water		20	x	x
chlorinated water		20	< 0,1	< 0,1
chlorine (dry)		20	< 0,1	< 0,1
chlorine (wet)		20	< 0,1	< 0,1
chloroacetic acid		20	> 1	> 1
chlorobenzene		20	< 0,1	< 0,1
chloroform		20	< 0,1	< 0,1
chromic acid		20	< 0,1	< 0,1
chromic acid		20	< 0,1	< 0,1
citric acid		20	< 0,1	< 0,1
citric acid		20	> 1	> 1
copper sulphate		20	< 0,1	< 0,1
cottonseed oil		20	< 0,1	< 0,1
cresol	30%	boiling p.	< 0,1	< 0,1
cupric chloride	50%	boiling p.	0,1 - 1	0,1 - 1
cupric cyanide	65%	80	< 0,1	< 0,1
cupric nitrate	65%	boiling p.	0,1 - 1	0,1 - 1
cycloheksane		20	< 0,1	< 0,1
cycloheksanone		20	< 0,1	< 0,1
diethylamine	20%	20	> 1	> 1
dimethylaniline		20	0,1 - 1	0,1 - 1
distilled water		20	0,1 - 1	0,1 - 1
electroplating solutions	50%	20	> 1	> 1
ethyl acetate	10%	20	< 0,1	< 0,1
ethyl chloride	25%	boiling p.	> 1	< 0,1
ethylene glycol	50%	20	< 0,1	< 0,1
fatty acids	20%	boiling p.	< 0,1	< 0,1
ferrous sulphate	40%	boiling p.	< 0,1	0,1 - 1
fluorine gas (wet)	85%	95	> 1	< 0,1
formaldehyde		20	< 0,1	< 0,1
formic acid	10%	10-100	0,1 - 1	< 0,1
formic acid	25%	20	< 0,1	< 0,1
formic acid	50%	20-80	0,1 - 1	< 0,1
formic acid	50%	boiling p.	> 1	0,1 - 1
formic acid	5-10%	20	< 0,1	< 0,1
fosforan amonu	10%	80	> 1	< 0,1
freon 12	50%	24-40	0,1 - 1	< 0,1
fruit juices and pulp	50%	boiling p.	> 1	0,1 - 1
furfural	90%	20	> 1	< 0,1
glucose	10%	20	> 1	> 1
glycerine	70%	20	> 1	> 1
hydrobromic acid	1%	boiling p.	< 0,1	< 0,1
hydrochloric acid	10%	boiling p.	0,1 - 1	< 0,1
hydrochloric acid	20%	boiling p.	> 1	< 0,1
hydrochloric acid	20%	20	< 0,1	< 0,1
hydrochloric acid	80%	20	> 1	< 0,1
hydrogen peroxide	100%	boiling p.	> 1	< 0,1
hydroquinone		20	< 0,1	< 0,1

MATERIALS' CHEMICAL RESISTANCE

MEDIUM		Temp. C°	STEEL 1.4301 304	STEEL 1.4404 316L
hypochlorous acid (chlorine water)		20	> 1	> 1
iodine	10%	20	< 0,1	< 0,1
lactic acid		20	< 0,1	< 0,1
lactic acid		20	< 0,1	< 0,1
lactic acid		20	0,1 - 1	< 0,1
lactic acid	1%	100	> 1	0,1 - 1
linseed oil	5%	20	0,1 - 1	< 0,1
magnesium chloride	5%	boiling p.	> 1	> 1
magnesium sulfate	10%	20	> 1	< 0,1
maleic acid	10%	boiling p.	> 1	> 1
methyl chloride	50%	20	> 1	> 1
methyl ethyl ketone	70%	20	> 1	> 1
milk	20-90%	20-100	> 1	> 1
mineral oils	93%	20	> 1	> 1
nickel chloride	0.5%	20	0,1 - 1 P	< 0,1 P
nickel sulphate	0.5%	boiling p.	> 1	> 1
nitric acid	1%	20	0,1 - 1 P	< 0,1 P
nitric acid	40%	20	> 1	> 1
nitric acid		20	< 0,1	< 0,1
nitric acid		20	< 0,1	< 0,1
oil		20	< 0,1	< 0,1
oils and fats		20	> 1	0,1 - 1
oleic acid		20	< 0,1	< 0,1
oleum		20	< 0,1	< 0,1
oxalic acid		20	< 0,1	< 0,1
palmitic acid		20	< 0,1	< 0,1
perchloric acid		20	< 0,1	< 0,1
perchloric acid		20	< 0,1	< 0,1
petrol (refined)	90%	20	< 0,1	< 0,1
petroleum oils		20	< 0,1	< 0,1
phenol		20	< 0,1	< 0,1
phosphoric acid		20	< 0,1	< 0,1
phosphoric acid		20	< 0,1	< 0,1
phosphoric acid		20	< 0,1	< 0,1
phosphorous trichloride		20	< 0,1	< 0,1
photographic solutions		20	x	x
picric acid		20	< 0,1	< 0,1
potassium carbonate		20	< 0,1	< 0,1
potassium chloride		20	< 0,1	< 0,1
potassium cyanide		20	0,1 - 1	< 0,1
potassium hydroxide		20	> 1	0,1 - 1
potassium permanganate		20	< 0,1	< 0,1
propane gas		20	> 1	> 1
prussic acid		20	< 0,1	< 0,1
sea water (natural)		20	0,1 - 1	< 0,1
silver nitrate		20	< 0,1	< 0,1
silver sulfate		20	< 0,1	< 0,1
sodium bicarbonate		20	< 0,1	< 0,1
sodium carbonate		20	< 0,1	< 0,1
sodium chloride		20	< 0,1	< 0,1
sodium cyanide		20	< 0,1	< 0,1

MEDIUM		Temp. C°	STEEL 1.4301 304	STEEL 1.4404 316L
sodium disulfide		20	< 0,1	< 0,1
sodium ferrocyanide		20	< 0,1	< 0,1
sodium hydroxide		20	< 0,1	< 0,1
sodium hypochlorite		20	< 0,1	< 0,1
sodium principle		20	< 0,1	< 0,1
sodium principle		20	x	x
sodium principle		20	0,1 - 1	> 1
sodium sulfide		20	0,1 - 1	< 0,1
sodium sulfide		20	0,1 - 1	< 0,1
sodium sulphate	20%	20	< 0,1	< 0,1
sodium thiosulfate	50%	20	< 0,1	< 0,1
stannic chloride	80%	20	> 1	< 0,1
stearic acid		20	0,1 - 1	< 0,1
sugar beet syrupe		20	< 0,1	< 0,1
sugarcane sap		20	< 0,1	< 0,1
sulfur		20	< 0,1	< 0,1
sulfur dioxide (dry)		20	< 0,1	< 0,1
sulfur dioxide (wet)		20	< 0,1	< 0,1
sulfuric acid		20	< 0,1	< 0,1
sulfuric acid		20	< 0,1	< 0,1
sulfuric acid		20	< 0,1	< 0,1
sulfuric acid		20	< 0,1	< 0,1
sulfuric acid		20	x	x
sulfuric acid		20	< 0,1	< 0,1
sulfuric acid		20	< 0,1	< 0,1
sulfuric acid		20	< 0,1	< 0,1
sulfuric acid		20	< 0,1	< 0,1
sulphurous acid		20	< 0,1	< 0,1
tan liquor		20	> 1	> 1
tannin (tannic acid)	nasycona	20	> 1	0,1 -1 P
tartaric acid	1g/l	20	0,1 -1 P	0,1 -1 P
toluene	1 mg/l	20	< 0,1	< 0,1
trichlorethylene		20	< 0,1	< 0,1
triethylamine		20	< 0,1	< 0,1
trisodium phosphate		20	0,1 -1 P	< 0,1 P
Turpentine		20	< 0,1	< 0,1
urea (carbamide)		20	< 0,1	< 0,1
urine		20	< 0,1	< 0,1
vinegar	10%	20	x	x
water ("acid mine")		20	< 0,1	< 0,1
water (fresh)		20	0,1 - 1	< 0,1
water (salt)		20	0,1 - 1	< 0,1
whisky	12,5% Cl	20	x	x
wine	20%	50	< 0,1	< 0,1
xylene	20%	100	< 0,1	< 0,1
zinc chloride	40%	100	0,1 -1	< 0,1
zinc sulphate		20	< 0,1	< 0,1

TABLE DESCRIPTION

corrosion coefficient (mm/year)	resistance
<0,1	complete
0,1 – 1	partial
> 1	non resistant
x	lack of data

corrosion factor	
S	stress corossion risk
P	pit corossion risk

FLOOR DRAINS




SUS304

FLOOR DRAINS



GENERAL INFORMATION

All floor drains and rodding eyes are made from stainless steel V2A (AISI 304) or V4A (AISI 316). The floor drain type depends on the load, amount of drained water and structural parameters (i.e. the floor thickness).

The floor drains are made of 1,5-2 [mm] steel sheets. All components are welded in argon shield to ensure high quality of joints

ADVANTAGES

- selected according to application and load,
- easy installation,
- due to suitable trap design, each gully is also the sewer rodding eye,
- simple design,
- easy to clean.

HOW TO READ CATALOGUE SYMBOLS

W	Wm	D	Dm	XXX	YYY	V	H	B	D	K	P	S
						1	2					

W	heavy duty floor drain with square upper part	XXX	upper part dimension	H	horizontal	B	Perforated sheet grating
Wm	mini floor drain with square upper part			1	single part	D	Ladder grating
D	heavy duty floor drain with round upper part			V	vertical	K	Anti-slip grating
Dm	mini floor drain with round upper part	YYY	outlet diameter	2	two part	P	Plate grating
						S	Plate grating with circumference gasket (so called 'tight cover')

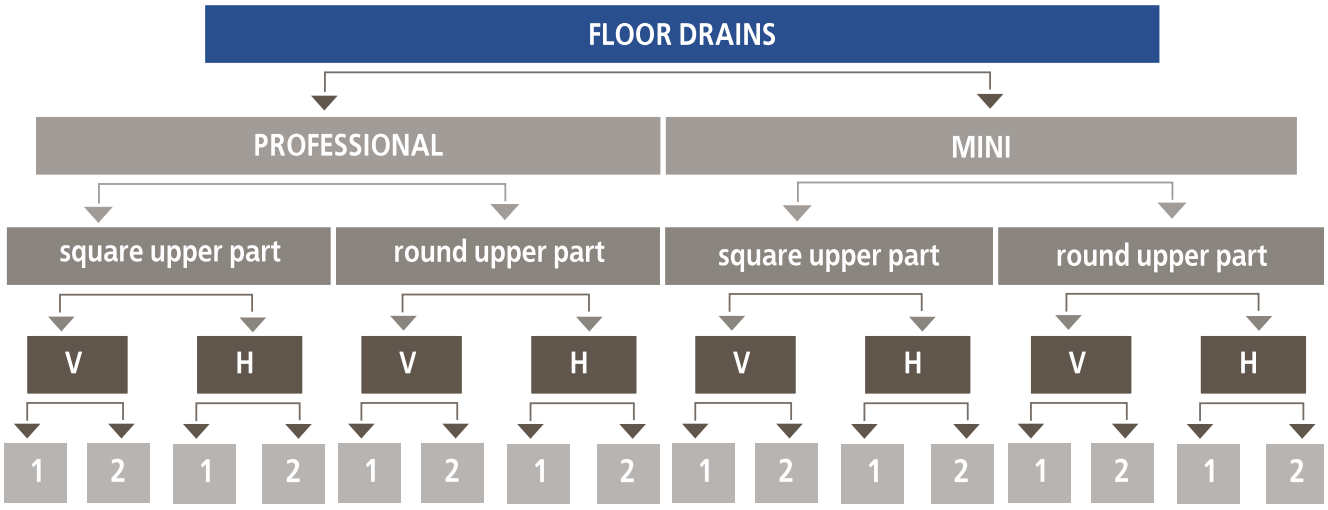
EXAMPLE 1

W300/110H2-B – it is professional floor drain with square lower part 300x300 [mm], with DN 110 [mm] outlet, horizontal, two-part, with perforated sheet grating.

EXAMPLE 2

D255/110V1-S is the floor drain: heavy duty with round upper part 255 [mm], with DN 110 [mm] outlet, vertical, single-part, with tight cover (plate grating with circumference gasket).

FIND THE FLOOR DRAIN YOU REQUIRE

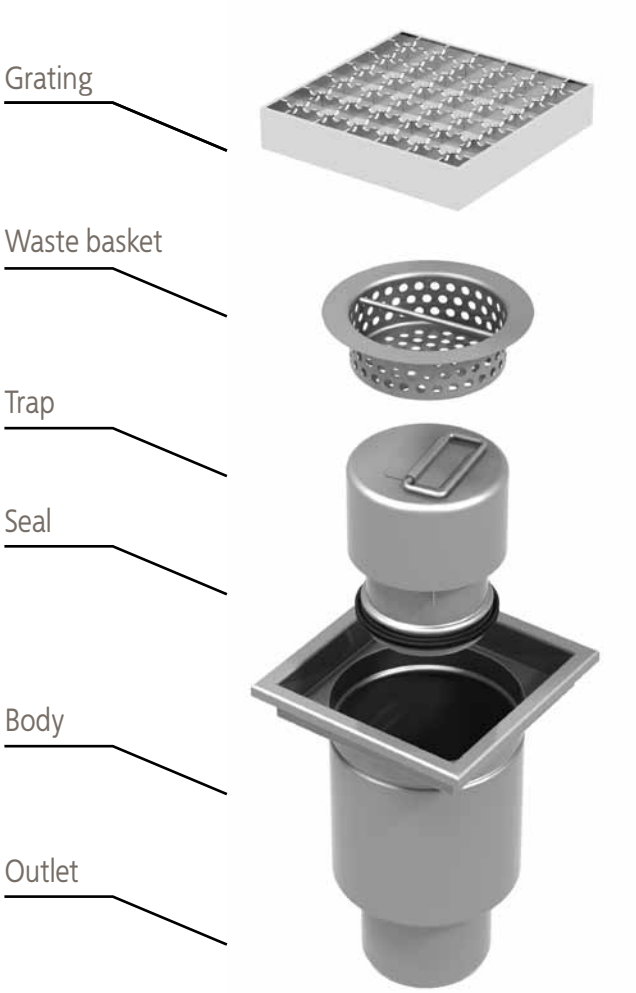


SELECTING THE FLOOR DRAINS

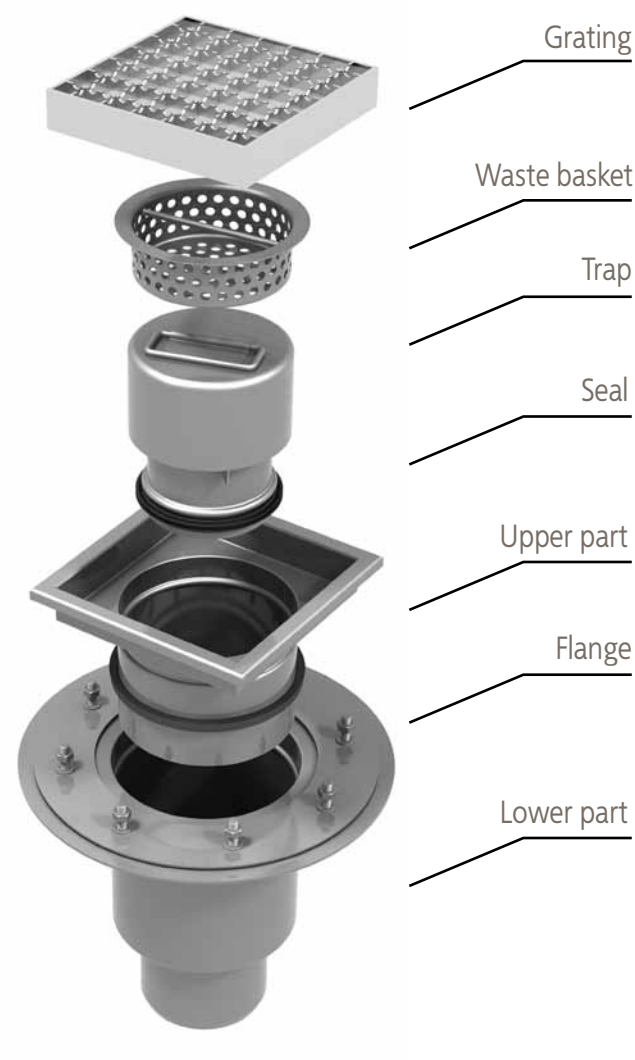
The appropriate floor drains are selected based on 2 main parameters:
1. Amount of drained wastewater (appropriate draining diameter and upper part dimension).
2. The load value, type and intensity (the load-bearing component is the grating, which can withstand a given load depending on its type and height).

FLOOR DRAINS

THE EXAMPLE OF SINGLE-PART FLOOR DRAIN



THE EXAMPLE OF TWO-PART FLOOR DRAIN



DESCRIPTION OF THE FLOOR DRAINS COMPONENTS

Bodies – round shape limits waste accumulation and enables easy waste removal. The welded joints are grinded to remove sharp edges and ensure safe installation or cleaning.

Gratings – available in various shapes, dimensions and finishing versions. The gratings are selected according to the loads and location of installation. We offer the following grating types: mesh anti-slip, ladder, plate and perforated sheet.

Waste baskets – recommended when the drained wastewater has a high content of solids.

Strainers – used when the amount of solids is small.

Traps – very functional and easy to maintain. Ensures easy access to the sewer, quick cleaning and offers a possibility of checking for locks.

Flanges – used when it's necessary to drain water from horizontal systems installed under the floor.

PERMISSIBLE LOAD CLASSES FOR FLOOR DRAIN GRATINGS

Gratings for floor drains type W200, dimension 163x163 mm

Grating height [mm]	Perforated sheet grating - B	Mesh grating - K	Ladder grating - D	Plate grating - P
20	H	K	M	M
30	L	L	M	M
40	L	M	M	M

H - 1,5 kN **K** - 3 kN **L** - 15 kN **M** - 125 kN

Gratings for floor drains type W250, dimension 213x213 mm

Grating height [mm]	Perforated sheet grating - B	Mesh grating - K	Ladder grating - D	Plate grating - P
20	–	–	–	–
30	L	L	M	M
40	L	M	M	M

H - 1,5 kN **K** - 3 kN **L** - 15 kN **M** - 125 kN

Gratings for floor drains type W300, dimension 265x265 mm

Grating height [mm]	Perforated sheet grating - B	Mesh grating - K	Ladder grating - D	Plate grating - P
20	–	–	–	–
30	L	L	M	M
40	L	M	M	M

H - 1,5 kN **K** - 3 kN **L** - 15 kN **M** - 125 kN

Gratings for floor drains type W400, dimension 365x365 mm

Grating height [mm]	Perforated sheet graitng - B	Mesh grating - K	Ladder grating - D	Plate grating - P
20	–	–	–	–
30	K	L	M	M
40	K	L	M	M

H - 1,5 kN **K** - 3 kN **L** - 15 kN **M** - 125 kN

Please note that the stated load classes are assumed for ideal load conditions (static). In reality the loads on gratings are much more complex (dynamic). Therefore, when selecting gratings, one should pay attention to several important details and ask such questions as:
- Will the grating be loaded (with a pallet of specific weight)?
- Will it be loaded with a forklift, if yes, what wheel type and size will the forklift be fitted with?
- Should this be a forklift truck (vehicle), then what will be the travel intensity. Several times a day, several dozen times a day or even several hundred times a day?

Only such information, together with the weight (forklift, pallet) will give us a full picture when selecting appropriate load class.

Bear in mind that with high intensity (repetitions) of even the smallest load, lower than the specified one, it is better to assume higher load class.

FLOOR DRAINS

LOAD RESSISTANCE OF FLOOR DRAINS MOUNTED INSIDE THE BUILDINGS ACCORDING TO PN-EN 1253-1 STANDARDS.

Below we present indications that need to be taken into consideration when selecting proper load class.

Class H 1.5
Appropriate for flat roofs (which do not perform any other function like terrace), covered with roofing paper with gravel.
Class K3
Covers the places for only pedestrian use (e.g. toilets, swimming pools built inside, balconies, basements, patios).
Class L 15
It is used when floor drains are installed in public use places, where vehicular traffic intensity is low, excluding fork lifts.
Class M 125
Required in areas with intensive vehicular traffic (e.g. halls, warehouses, garages)

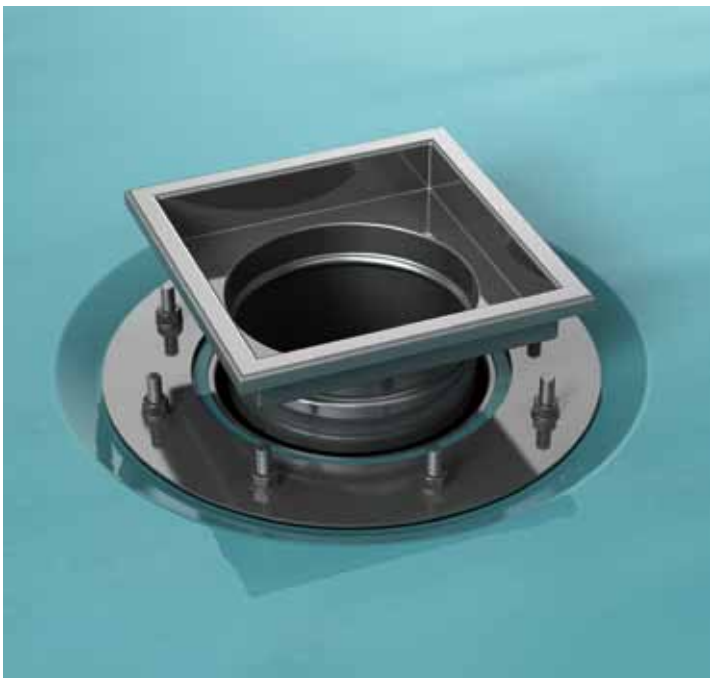
INSTALLATION OF SINGLE-PART FLOOR DRAINS

1. Make sure the drain pipe is at the correct height.
2. During concrete pouring, the upper part should be 1-1,5 [mm] below the floor level.
3. Next floor layers can be made when the upper part is stabilized.
4. During concrete pouring make sure, that the upper part clearance is not narrowed.
5. Make sure concrete gets to all places, even difficult of access ones.

INSTALLATION OF TWO-PART FLOOR DRAINS

1. First, put the lower part of the floor drain in the structural part of the floor. The lower part should be placed in the hollow of 15-20 [mm] to ensure adequate draining of the condensate from the damp--proof course.
2. Make the damp-proof course and secure it with the clamping ring of the lower part.
3. Next, position the upper part on the required level. The upper part edge should be placed about 1-1,5 [mm] below the floor level.
4. Next floor layers can be made when the upper part is stabilized.
5. During concrete pouring make sure that the upper part clearance is not narrowed.
6. Make sure concrete gets to all places, even difficult of access ones.

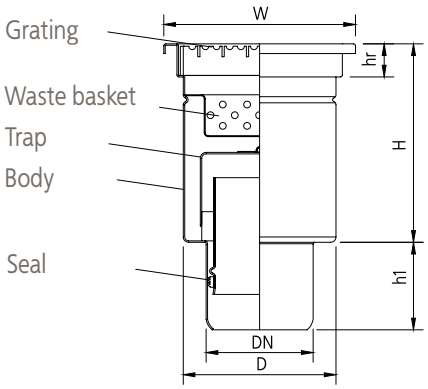




heavy duty **FLOOR DRAINS** vertical with square upper part single-part





* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

Symbol		W200/75V1	W200/110V1	W250/110V1	W300/160V1	W400/200V1
Catalogue number mat. 304		00.005075 - *	00.005110 - *	00.001110 - *	00.001160 - *	00.001200 - *
Dimensions [mm]	DN	75	110	110	160	200
	H	194	194	234	244	354
	h1	90	90	90	90	90
	D	157	157	193	255	348
	W	200x200	200x200	250x250	300x300	400x400
	hr	30	30	30	30	30

You can find classes of permissible loads of floor drain gratings on page 17.

GRATING SYMBOLS



mesh anti-slip grating symbol – K



ladder grating symbol – D



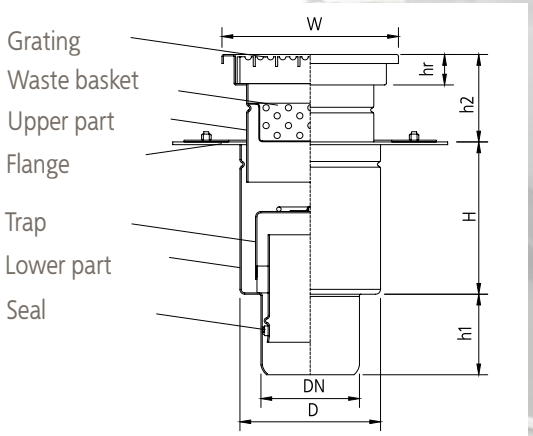
perforated sheet grating symbol – B



plate grating symbol - P

heavy duty FLOOR DRAINS vertical with square upper part two-part





* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

Symbol		W200/75V2	W200/110V2	W250/110V2	W300/160V2	W400/200V2
Catalogue number mat. 304		00.006075 - *	00.006110 - *	00.002110 - *	00.002160 - *	00.002200 - *
Dimensions [mm]	DN	75	110	110	160	200
	H	160	160	200	210	320
	h1	90	90	90	90	90
	h2	50-120	50-120	50-160	50-160	50-160
	D	157	157	193	255	348
	W	200x200	200x200	250x250	300x300	400x400
	hr	30	30	30	30	30

You can find classes of permissible loads of floor drain gratings on page 17.

GRATING SYMBOLS



mesh anti-slip grating symbol – K



ladder grating symbol – D



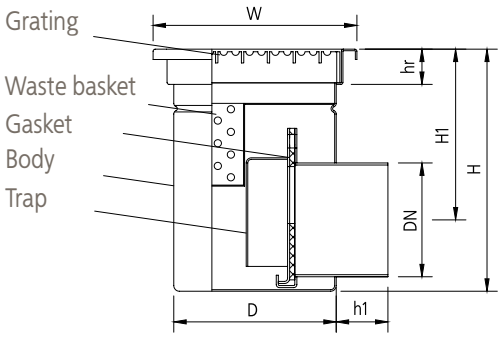
perforated sheet grating symbol – B



plate grating symbol - P

heavy duty **FLOOR DRAINS** horizontal with square upper part single-part





* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

Symbol		W200/75H1	W200/110H1	W250/110H1	W300/160H1	W400/200H1
Catalogue number mat. 304		**00.007075 - ***	**00.007110 - ***	**00.003110 - ***	**00.003160 - ***	**00.003200 - ***
Dimensions [mm]	DN	75	110	110	160	200
	H	224	224	244	294	354
	H1	170	150	170	194	232
	h1	60	60	60	90	90
	D	157	157	193	255	348
	W	200x200	200x200	250x250	300x300	400x400
	hr	30	30	30	30	30

You can find classes of permissible loads of floor drain gratings on page 17.

GRATING SYMBOLS



mesh anti-slip grating symbol – K



ladder grating symbol – D



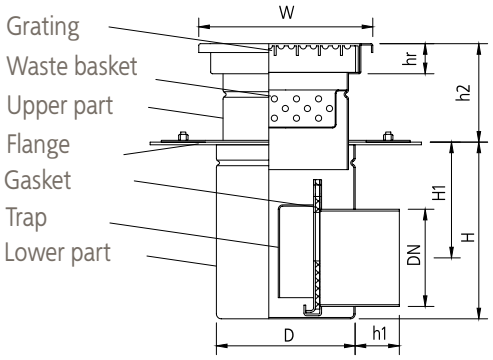
perforated sheet grating symbol – B



plate grating symbol - P

heavy duty **FLOOR DRAINS** horizontal with square upper part two-part





* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

Symbol		W200/75H2	W200/110H2	W250/110H2	W300/160H2	W400/200H2
Catalogue number mat. 304		**00.008075 - ***	**00.008110 - ***	**00.004110 - ***	**00.004160 - ***	**00.004200 - ***
Dimensions [mm]	DN	75	110	110	160	200
	H	190	190	210	260	320
	H1	135	120	140	160	200
	h1	60	60	60	90	90
	h2	50-120	80-120	50-160	50-160	50-160
	D	157	157	193	255	348
	W	200x200	200x200	250x250	300x300	400x400
	hr	30	30	30	30	30

You can find classes of permissible loads of floor drain gratings on page 17.

GRATING SYMBOLS



mesh anti-slip grating symbol – K



ladder grating symbol – D



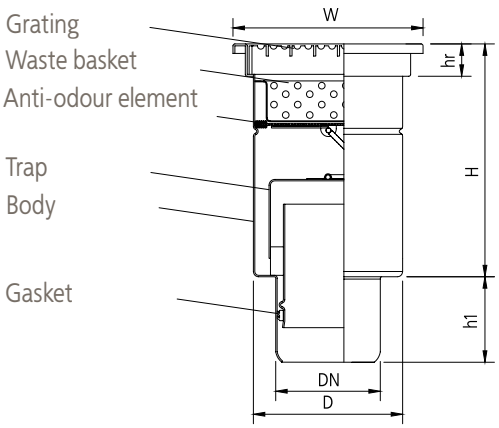
perforated sheet grating symbol – B



plate grating symbol - P

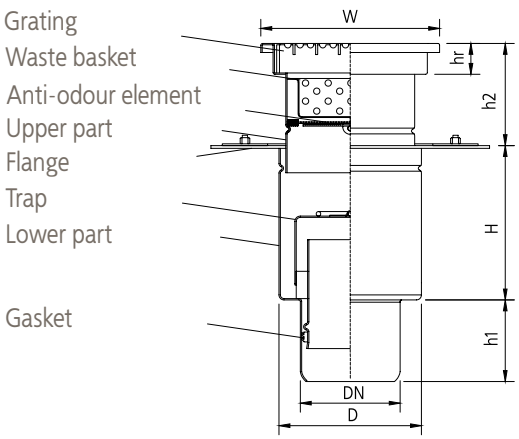
anti-scent FLOOR DRAINS vertical with square upper part single-part





anti-scent FLOOR DRAINS vertical with square upper part two-part



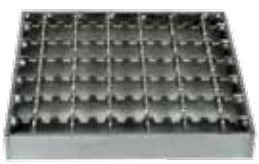


Symbol		Wa200/110V1	Wa200/110V2
Catalogue number mat. 304		00.021110 – *	00.022110 – *
Dimensions [mm]	DN	110	110
	H	245	160
	h1	90	90
	h2	-	50-120
	D	157	157
	W	200x200	200x200
	hr	30	30

* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

You can find classes of permissible loads of floor drain gratings on page 17.

OZNACZENIA RUSZTÓW



mesh anti-slip grating symbol – K



ladder grating symbol – D



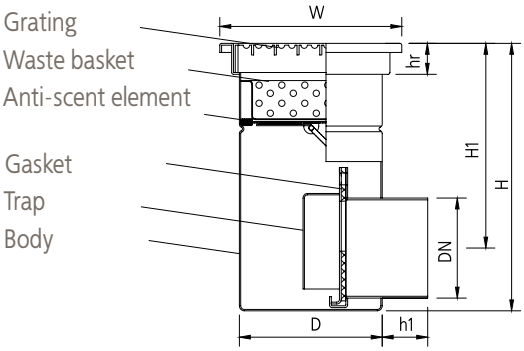
perforated sheet grating symbol – B



plate grating symbol - P

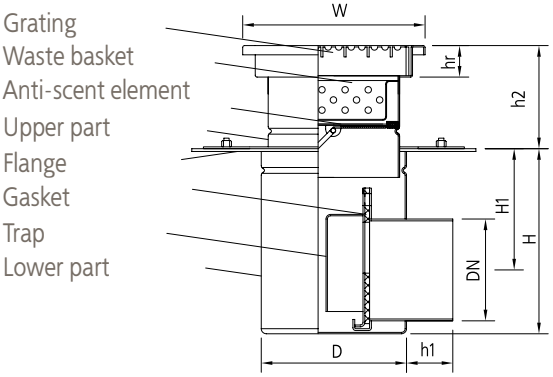
anti-scent FLOOR DRAINS horizontal with square upper part single-part





anti-scent FLOOR DRAINS horizontal with square upper part two-part



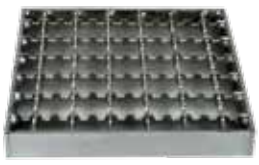


Symbol		Wa200/110H1	Wa200/110H2
Catalogue number mat. 304		00.023110 - *	00.024110 - *
Dimensions [mm]	DN	110	110
	H	274	190
	H1	205	120
	h1	60	90
	h2	-	80-120
	D	157	157
	W	200x200	200x200
	hr	30	30

* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

You can find classes of permissible loads of floor drain gratings on page 17.

GRATING SYMBOLS



mesh anti-slip grating symbol – K



ladder grating symbol – D



perforated sheet grating symbol – B

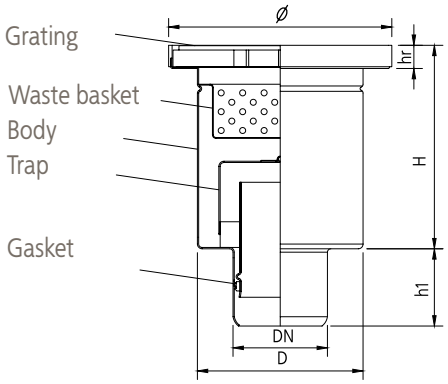


plate grating symbol - P

heavy duty FLOOR DRAINS vertical with square upper part single-part

WITH OUTLET DN 110

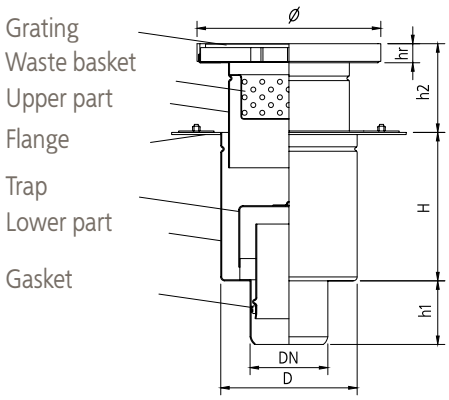




heavy duty FLOOR DRAINS vertical with square upper part two-part

WITH OUTLET DN 110





* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

Symbol		D200/110V1	D255/110V1	D200/110V2	D255/110V2
Catalogue number mat. 304		00.015110 - *	00.009110 - *	00.016110 - *	00.010110 - S
Dimensions [mm]	DN	110	110	110	110
	H	187	227	160	200
	h1	90	90	90	90
	h2	-	-	45-110	45-160
	D	157	193	157	193
	ø	200	255	200	255
	hr	25	25	25	25

You can find classes of permissible loads of floor drain gratings on page 17.

Suction cup is used to remove floor drain's tight cover grating. Suction cup is an additional element – it is not sold as a part of floor drain.



In case of floor drains with tight cover grating we use 8mm thick plate grating with circumferential gasket.

GRATING SYMBOLS



plate grating symbol – P



mesh anti-slip grating symbol – K



ladder grating symbol – B

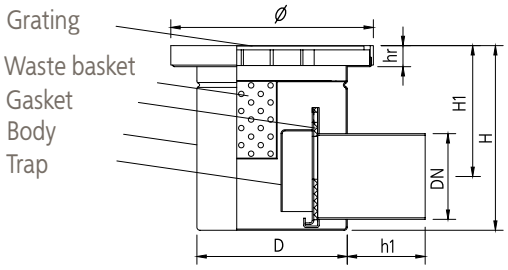


tight cover grating symbol - S

heavy duty FLOOR DRAINS horizontal with square upper part single-part

WITH OUTLET DN 110

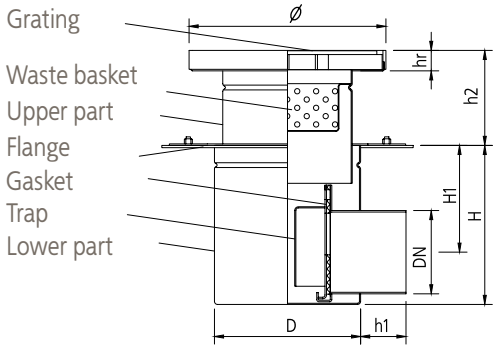




heavy duty FLOOR DRAINS horizontal with square upper part two-part

WITH OUTLET DN 110





* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

Symbol		D200/110H1	D255/110H1	D200/110H2	D255/110H2
Catalogue number mat. 304		00.017110 - *	00.011110 - *	00.018110 - *	00.012110 - *
Dimensions [mm]	DN	110	110	110	110
	H	217	237	190	210
	H1	145	165	120	140
	h1	60	60	60	60
	h2	–	–	45-120	45-120
	D	157	193	157	193
	ø	200	255	200	255
	Hr	25	25	25	25

You can find classes of permissible loads of floor drain gratings on page 17.

GRATING SYMBOLS



plate grating symbol – P



mesh anti-slip grating symbol – K



ladder grating symbol – B



tight cover grating symbol - S

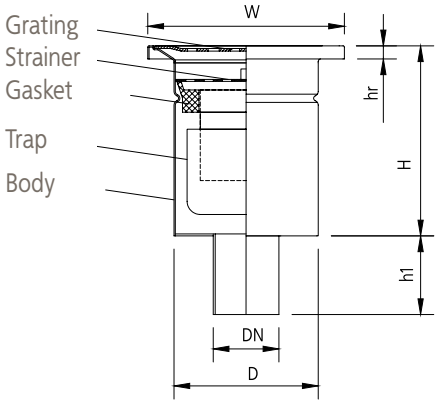
Suction cup is used to remove floor drain's tight cover grating. Suction cup is an additional element – it is not sold as a part of floor drain.



In case of floor drains with tight cover grating we use 8mm thick plate grating with circumferential gasket.

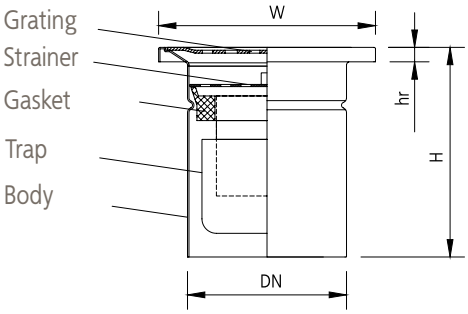
mini **FLOOR DRAINS** vertical with square upper part single-part





WITH OUTLET DN 50





WITH OUTLET DN 110

Symbol		Wmk150/50V1	Wmk150/75V1	Wmk150/110V1
Catalogue number mat. 304		**00.056050 - ***	**00.056075 - ***	**00.056110 - ***
Dimensions [mm]	DN	50	75	110
	H	150	150	150
	h1	60	60	-
	D	110	110	110
	W	150x150	150x150	150x150
	Hr	2	2	2

Symbols and numbers can be used alternatively.

You can find classes of permissible loads of floor drain gratings on page 17.

FOR MINI FLOOR DRAIN WMK150 THERE IS ONLY PERFORATED SHEET (B) GRATING AVAILABLE

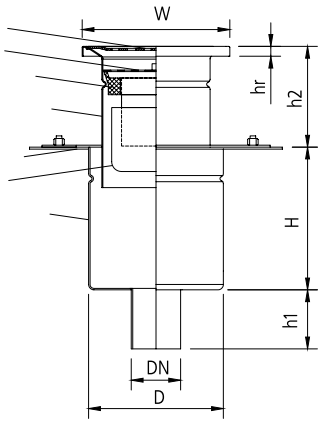


perforated sheet
grating symbol – B

mini FLOOR DRAINS vertical
with square upper part two-part



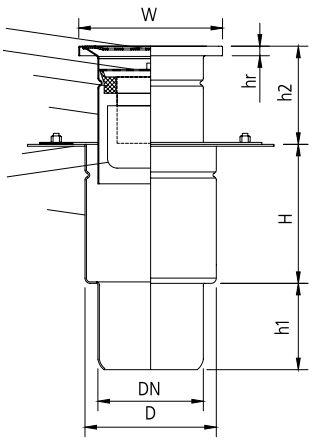
Grating
Strainer
Gasket
Upper part
Flange
Trap
Lower part



WITH OUTLET DN 50



Grating
Strainer
Gasket
Upper part
Flange
Trap
Lower part



WITH OUTLET DN 110

Symbol		Wmk150/50V2	Wmk150/75V2	Wmk150/110V2
Catalogue number mat. 304		00.057050 - *	00.057075 - *	00.057110 - *
Dimensions [mm]	DN	50	75	110
	H	140	140	140
	h1	60	60	90
	h2	50-130	50-130	50-130
	D	137	137	137
	W	150x150	150x150	150x150
	Hr	2	2	2

Symbols and numbers can be used alternatively.

You can find classes of permissible loads of floor drain gratings on page 17.

FOR MINI FLOOR DRAIN WMK150 THERE IS ONLY PERFORATED SHEET (B) GRATING AVAILABLE

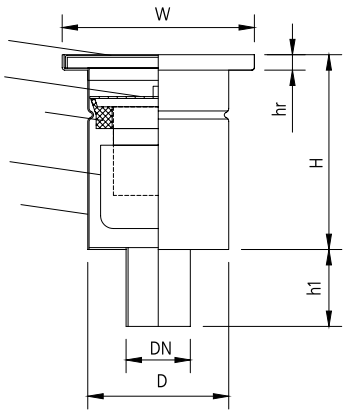


perforated sheet
grating symbol – B

mini **FLOOR DRAINS** vertical with square upper part single-part



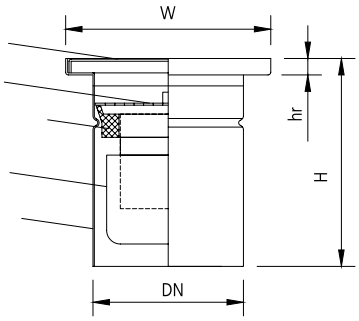
Grating
Strainer
Gasket
Trap
Body



WITH OUTLET DN 50



Grating
Strainer
Gasket
Trap
Body



WITH OUTLET DN 110

Symbol		Wm150/50V1	Wm150/75V1	Wm150/110V1
Catalogue number mat. 304		00.032050 - *	00.032075 - *	00.0032110 - *
Dimensions [mm]	DN	50	75	110
	H	150	150	150
	h1	60	60	-
	D	110	110	110
	W	150x150	150x150	150x150
	Hr	10	10	10

Symbols and numbers can be used alternatively.

You can find classes of permissible loads of floor drain gratings on page 17.

FOR MINI FLOOR DRAIN WM150 THERE IS ONLY LADDER (D) GRATING AVAILABLE

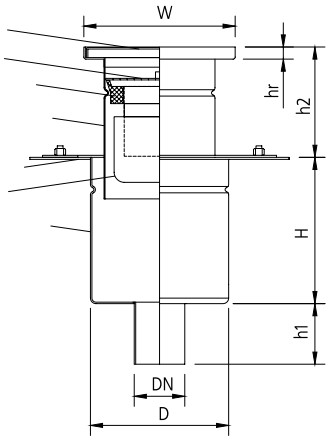


ladder grating
symbol – D

mini FLOOR DRAINS vertical
with square upper part two-part



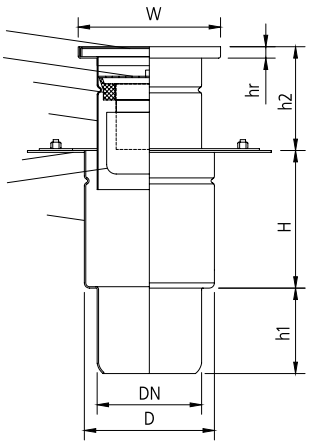
Grating
Strainer
Gasket
Upper part
Flange
Trap
Lower part



WITH OUTLET DN 50



Grating
Strainer
Gasket
Upper part
Flange
Trap
Lower part



WITH OUTLET DN 110

Symbol		Wm150/50V2	Wm150/75V2	Wm150/110V2
Catalogue number mat. 304		**00.033050 - ***	**00.033075 - ***	**00.057110 - ***
Dimensions [mm]	DN	50	75	110
	H	140	140	140
	h1	60	60	90
	h2	50-130	50-130	50-130
	D	137	137	137
	W	150x150	150x150	150x150
	Hr	10	10	10

Symbols and numbers can be used alternatively.

You can find classes of permissible loads of floor drain gratings on page 17.

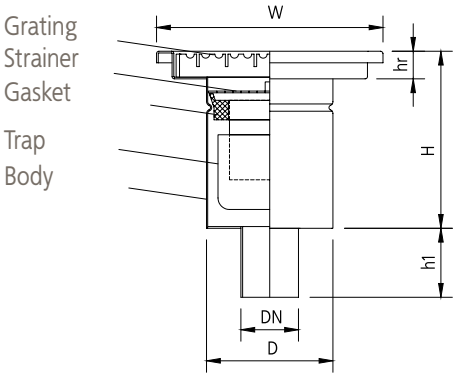
FOR MINI FLOOR DRAIN WM150 THERE IS ONLY LADDER (D) GRATING AVAILABLE



ladder grating
symbol – D

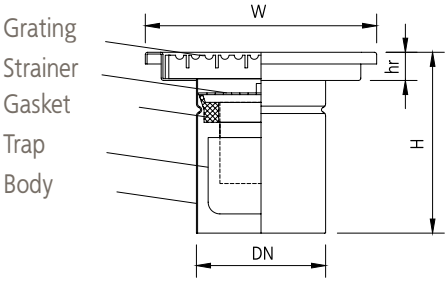
mini **FLOOR DRAINS** vertical with square upper part single-part





WITH OUTLET DN 50





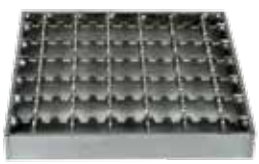
WITH OUTLET DN 110

Symbol		Wm200/50V1	Wm200/75V1	Wm200/110V1
Catalogue number mat. 304		00.030050 - *	00.030075 - *	00.030110 - *
Dimensions [mm]	DN	50	75	110
	H	154	154	154
	h1	60	60	-
	D	110	110	110
	W	200x200	200x200	200x200
	Hr	20	20	20

*Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

You can find classes of permissible loads of floor drain gratings on page 17.

GRATING SYMBOLS



mesh anti-slip grating symbol – K



ladder grating symbol – D



perforated sheet grating symbol – B

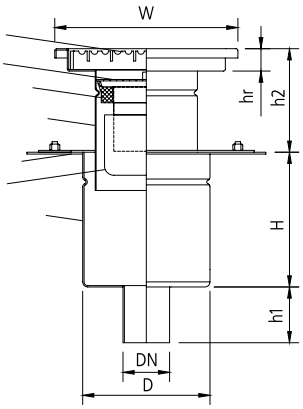


plate grating symbol - P

mini FLOOR DRAINS vertical
with square upper part two-part



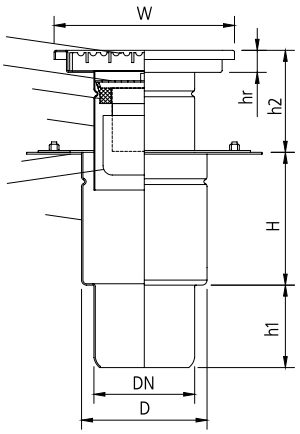
Grating
Strainer
Gasket
Upper part
Flange
Trap
Lower part



WITH OUTLET DN 50



Grating
Strainer
Gasket
Upper part
Flange
Trap
Lower part



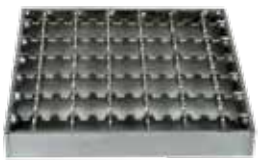
WITH OUTLET DN 110

Symbol		Wm200/50V2	Wm200/75V2	Wm200/110V2
Catalogue number mat. 304		00.031050 - *	00.031075 - *	00.031110 - *
Dimensions [mm]	DN	50	75	110
	H	140	140	140
	h1	60	60	90
	h2	50-130	50-130	50-130
	D	137	137	137
	W	200x200	200x200	200x200
	Hr	20	20	20

* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

You can find classes of permissible loads of floor drain gratings on page 17.

GRATING SYMBOLS



mesh anti-slip grating symbol – K



ladder grating symbol – D



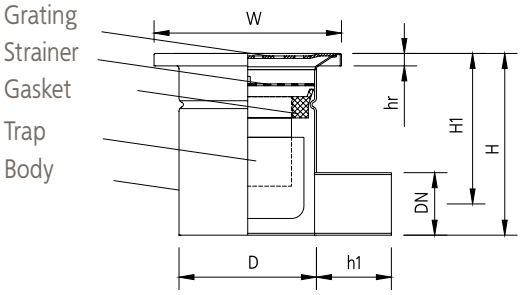
perforated sheet grating symbol – B



plate grating symbol - P

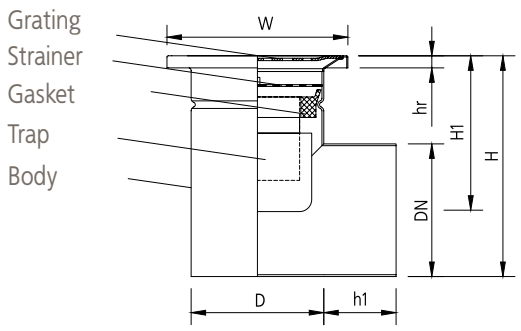
mini **FLOOR DRAINS** horizontal with square upper part single-part





WITH OUTLET DN 50





WITH OUTLET DN 110

Symbol		Wmk150/50H1	Wmk150/75H1	Wmk150/110H1
Catalogue number mat. 304		00.058050 - *	00.058075 - *	00.058110 - *
Dimensions [mm]	DN	50	75	110
	H	150	150	185
	H1	120	105	130
	h1	60	60	60
	D	110	110	110
	W	150x150	150x150	150x150
	Hr	2	2	2

* Symbols and numbers can be used alternatively.

You can find classes of permissible loads of floor drain gratings on page 17.

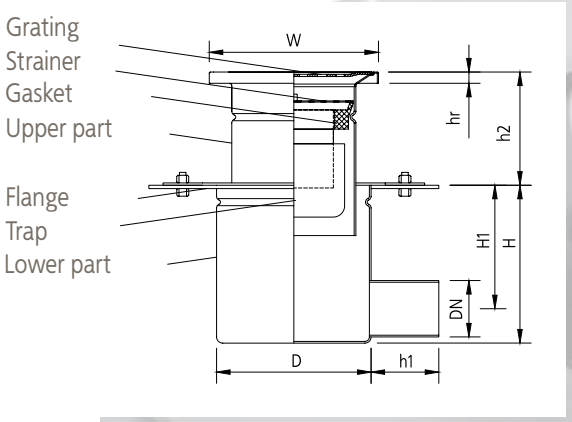
FOR MINI FLOOR DRAIN WMK150 THERE IS ONLY PERFORATED SHEET (B) GRATING AVAILABLE



perforated sheet grating symbol – B

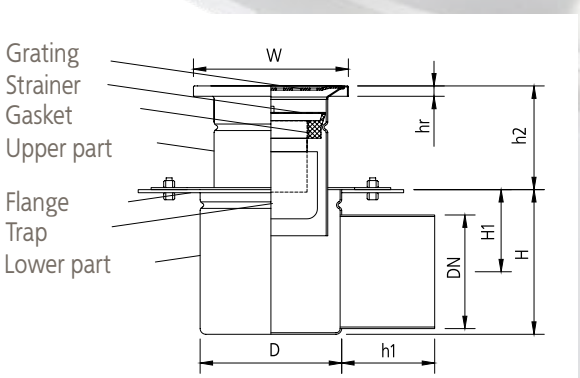
mini FLOOR DRAINS horizontal with square upper part two-part





WITH OUTLET DN 50





WITH OUTLET DN 110

Symbol		Wmk150/50H2	Wmk150/75H2	Wmk150/110H2
Catalogue number mat. 304		00.059050 - *	00.059075 - *	00.059110 - *
Dimensions [mm]	DN	50	75	110
	H	140	140	140
	H1	103	90	80
	h1	60	60	60
	h2	50-130	50-130	50-130
	D	137	137	137
	W	150x150	150x150	150x150
	Hr	2	2	2

Symbols and numbers can be used alternatively.

You can find classes of permissible loads of floor drain gratings on page 17.

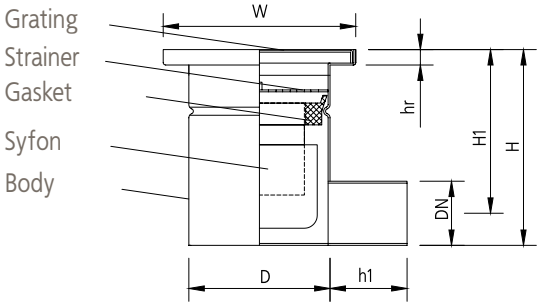
FOR MINI FLOOR DRAIN WMK150 THERE IS ONLY PERFORATED SHEET (B) GRATING AVAILABLE



perforated sheet
grating symbol – B

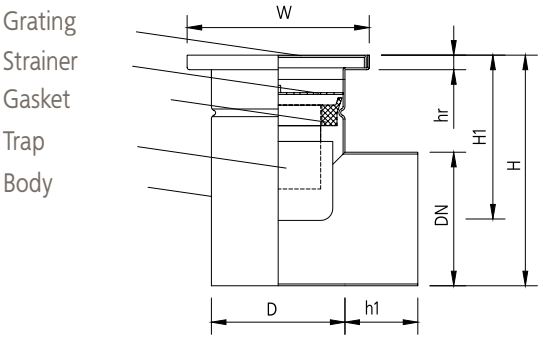
mini **FLOOR DRAINS** horizontal with square upper part single-part





WITH OUTLET DN 50





WITH OUTLET DN 110

Symbol		Wm150/50H1	Wm150/75H1	Wm150/110H1
Catalogue number mat. 304		00.042050 - *	00.042075 - *	00.042110 - *
Dimensions [mm]	DN	50	75	110
	H	150	150	190
	H1	120	110	135
	h1	60	60	60
	D	110	110	110
	W	150x150	150x150	150x150
	Hr	10	10	10

Symbols and numbers can be used alternatively.

You can find classes of permissible loads of floor drain gratings on page 17.

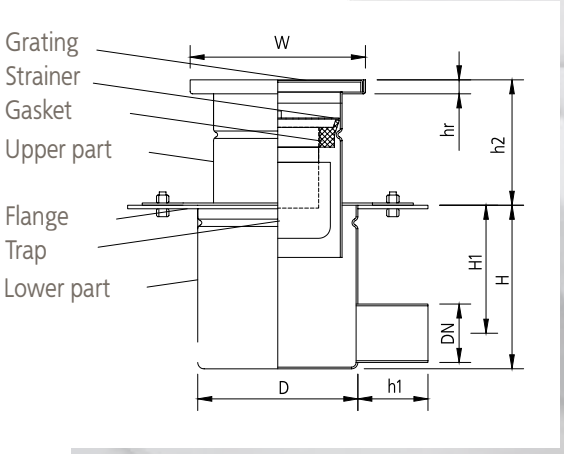
FOR MINI FLOOR DRAIN WM150 THERE IS ONLY LADDER (D) GRATING AVAILABLE



ladder grating
symbol – D

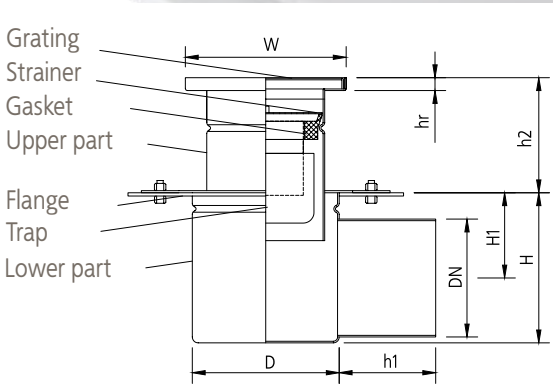
mini FLOOR DRAINS horizontal with square upper part two-part





WITH OUTLET DN 50





WITH OUTLET DN 110

Symbol		Wm150/50H2	Wm150/75H2	Wm150/110H2
Catalogue number mat. 304		00.043050 - *	00.043075 - *	00.043110 - *
Dimensions [mm]	DN	50	75	110
	H	140	140	140
	H1	103	90	80
	h1	60	60	90
	h2	50-130	50-130	50-130
	D	137	137	137
	W	150x150	150x150	150x150
	Hr	10	10	10

Symbols and numbers can be used alternatively.

You can find classes of permissible loads of floor drain gratings on page 17.

FOR MINI FLOOR DRAIN WM150 THERE IS ONLY LADDER (D) GRATING AVAILABLE

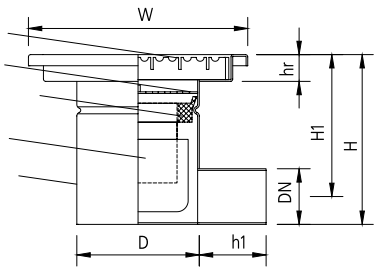


ladder grating
symbol – D

mini **FLOOR DRAINS** horizontal with square upper part single-part



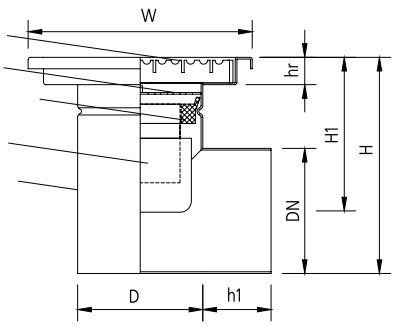
Grating
Strainer
Gasket
Trap
Body



WITH OUTLET DN 50



Grating
Strainer
Gasket
Trap
Body



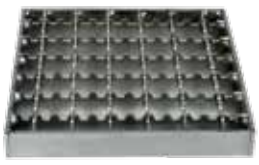
WITH OUTLET DN 110

Symbol		Wm200/50H1	Wm200/75H1	Wm200/110H1
Catalogue number mat. 304		00.040050 - *	00.040075 - *	00.040110 - *
Dimensions [mm]	DN	50	75	110
	H	154	154	194
	H1	127	114	140
	h1	60	60	90
	D	110	110	110
	W	200x200	200x200	200x200
	Hr	20	20	20

* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).v

You can find classes of permissible loads of floor drain gratings on page 17.

GRATING SYMBOLS



mesh anti-slip grating symbol – K



ladder grating symbol – D



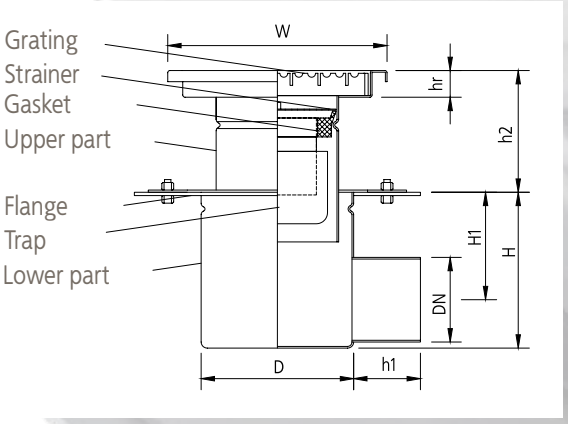
perforated sheet grating symbol – B



plate grating symbol - P

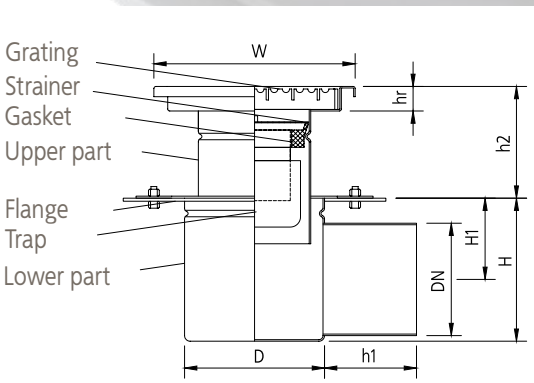
mini FLOOR DRAINS horizontal with square upper part two-part





WITH OUTLET DN 50





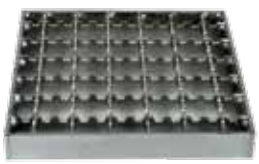
WITH OUTLET DN 110

Symbol		Wm200/50H2	Wm200/75H2	Wm200/110H2
Catalogue number mat. 304		00.041050 - *	00.041075 - *	00.041110 - *
Dimensions [mm]	DN	50	75	110
	H	140	140	140
	H1	103	90	80
	h1	60	60	90
	h2	50-130	50-130	50-130
	D	137	137	137
	W	200x200	200x200	200x200
	Hr	20	20	20

* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

You can find classes of permissible loads of floor drain gratings on page 17.

GRATING SYMBOLS



mesh anti-slip grating symbol – K



ladder grating symbol – D



perforated sheet gratin1g symbol – B

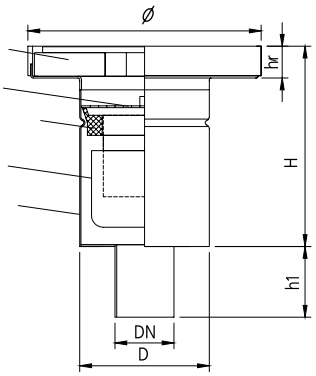


plate grating symbol - P

mini **FLOOR DRAINS** vertical with round upper part single-part



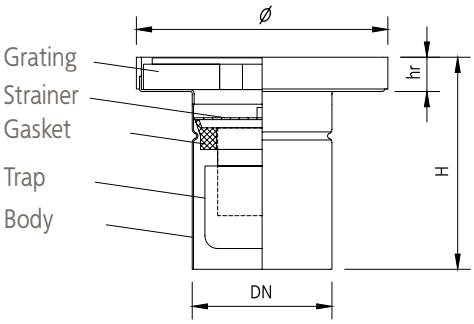
Grating
Strainer
Gasket
Trap
Body



WITH OUTLET DN 50



Grating
Strainer
Gasket
Trap
Body



WITH OUTLET DN 110

* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

Symbol		Dm160/50V1	Dm200/50V1	Dm160/75V1	Dm200/75V1	Dm160/110V1	Dm200/110V1
Catalogue number mat. 304		00.036050 - *	00.034050 - *	00.036075 - *	00.034075 - *	00.036110 - *	00.034110 -*
Dimensions [mm]	DN	50	50	75	75	110	110
	H	165	165	165	165	165	165
	h1	60	60	60	60	-	-
	D	110	110	110	110	110	110
	ø	160	200	160	200	160	200
	hr	25	25	25	25	25	25

You can find classes of permissible loads of floor drain gratings on page 17.

Suction cup is used to remove floor drain's tight cover grating. Suction cup is an additional element – it is not sold as a part of floor drain.



In case of floor drains with tight cover grating we use 8mm thick plate grating with circumferential gasket.

GRATING SYMBOLS



plate grating symbol – P



mesh anti-slip grating symbol – K



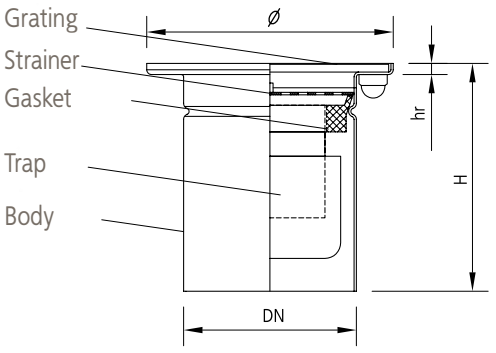
ladder grating symbol – B

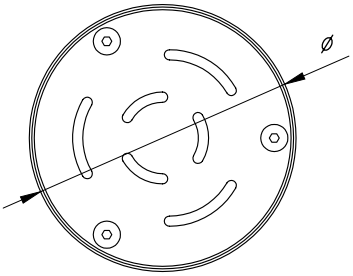


tight cover grating symbol - S

mini FLOOR DRAINS vertical
with square upper part single-part







* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

Symbol		Dms160/110 V1
Catalogue number mat. 304		**00.038110 - P**
Dimensions [mm]	DN	110
	H	145
	D	110
	ø	160
	hr	5

You can find classes of permissible loads of floor drain gratings on page 17.

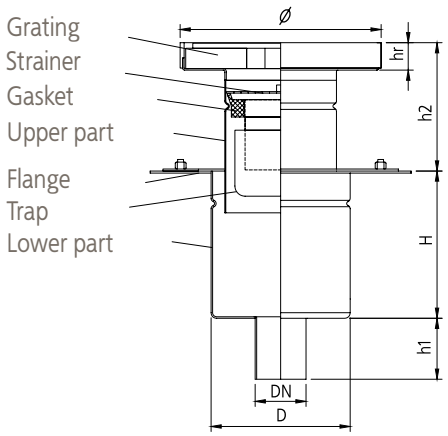
GRATING SYMBOL



There is only 5mm thick plate perforated sheet (P) available for floor drain Dms160/110V1.

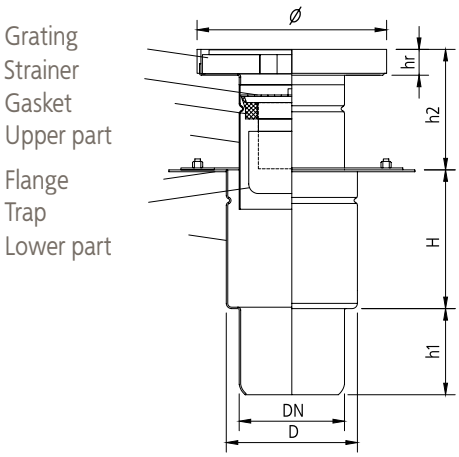
mini **FLOOR DRAINS** vertical with round upper part two-part





WITH OUTLET DN 50





WITH OUTLET DN 110

* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

Symbol		Dm160/50V2	Dm200/50V2	Dm160/75V2	Dm200/75V2	Dm160/110V2	Dm200/110V2
Catalogue number mat. 304		00.037050 - *	00.035050 - *	00.037075 - *	00.035075 - *	00.037110 - *	00.035110 - *
Dimensions [mm]	DN	50	50	75	75	110	110
	H	140	140	140	140	140	140
	h1	60	60	60	60	90	90
	h2	50-130	50-130	50-130	50-130	50-130	50-130
	D	137	137	137	137	137	137
	ø	160	200	160	200	160	200
	hr	25	25	25	25	25	25

You can find classes of permissible loads of floor drain gratings on page 17.

Suction cup is used to remove floor drain's tight cover grating. Suction cup is an additional element – it is not sold as a part of floor drain.



In case of floor drains with tight cover grating we use 8mm thick plate grating with circumferential gasket.

GRATING SYMBOLS



plate grating symbol – P



mesh anti-slip grating symbol – K



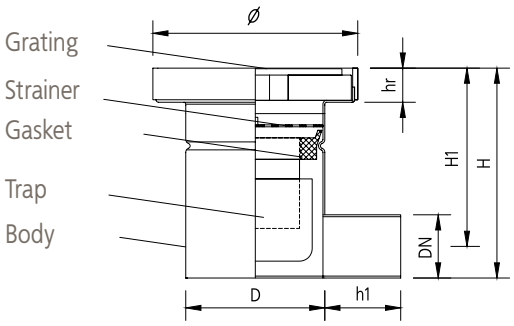
ladder grating symbol – B



tight cover grating symbol - S

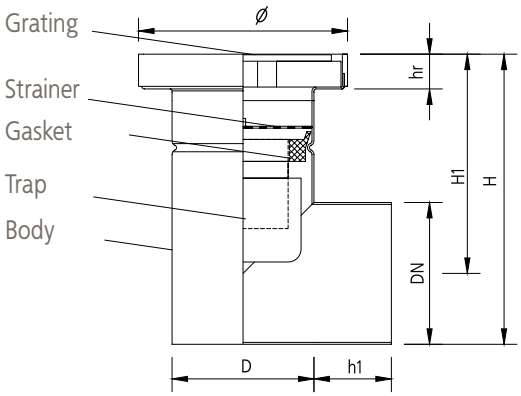
mini FLOOR DRAINS horizontal with round upper part single-part





WITH OUTLET DN 50





WITH OUTLET DN 110

* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

Symbol		Dm160/50H1	Dm200/50H1	Dm160/75H1	Dm200/75H1	Dm160/110H1	Dm200/110H1
Catalogue number mat. 304		00.046050 - *	00.044050 - *	00.046075 - *	00.044075 - *	00.046110 - *	00.044110 - *
Dimensions [mm]	DN	50	50	75	75	110	110
	H	165	165	165	165	207	207
	H1	140	140	127	127	152	152
	h1	60	60	60	60	60	60
	D	110	110	110	110	110	110
	ø	160	200	160	200	160	200
	hr	25	25	25	25	25	25

You can find classes of permissible loads of floor drain gratings on page 17.

Suction cup is used to remove floor drain's tight cover grating. Suction cup is an additional element – it is not sold as a part of floor drain



In case of floor drains with tight cover grating we use 8mm thick plate grating with circumferential gasket.

GRATING SYMBOLS



plate grating symbol – P



mesh anti-slip grating symbol – K



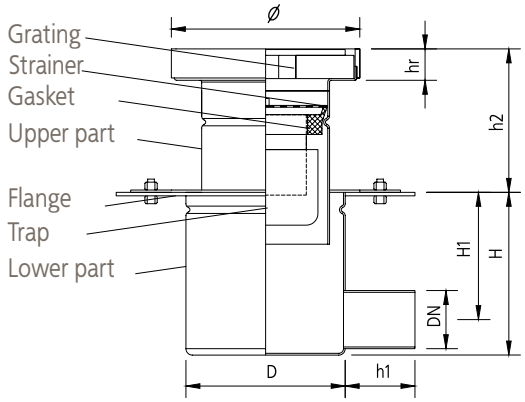
ladder grating symbol – B



tight cover grating symbol - S

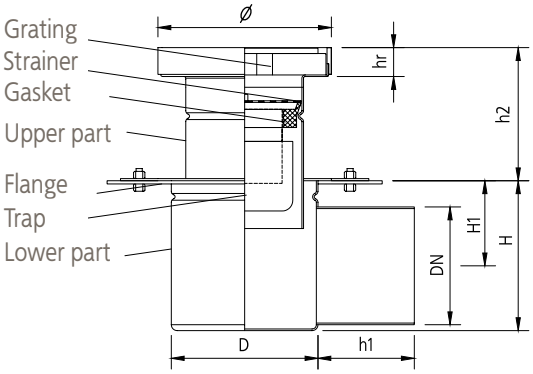
mini **FLOOR DRAINS** vertical with square upper part two-part





WITH OUTLET DN 50





WITH OUTLET DN 110

* Number or symbol of the floor drain needs to be completed with the proper grating symbol (symbols and numbers can be used alternatively).

Symbol		Dm160/50H2	Dm200/50H2	Dm160/75H2	Dm200/75H2	Dm160/110H2	Dm200/110H2
Catalogue number mat. 304		00.047050 - *	00.045050 - *	00.047075 - *	00.045075 - *	00.047110 - *	00.045110 - *
Dimensions [mm]	DN	50	50	75	75	110	110
	H	140	140	140	140	140	140
	H1	103	103	90	90	80	80
	h1	60	60	60	60	90	90
	h2	50-130	50-130	50-130	50-130	50-130	50-130
	D	137	137	137	137	137	137
	ø	160	200	160	200	160	200
	hr	25	25	25	25	25	25

You can find classes of permissible loads of floor drain gratings on page 17.

Suction cup is used to remove floor drain's tight cover grating. Suction cup is an additional element – it is not sold as a part of floor drain



In case of floor drains with tight cover grating we use 8mm thick plate grating with circumferential gasket.

GRATING SYMBOLS



plate grating symbol – P



mesh anti-slip grating symbol – K



ladder grating symbol – B



tight cover grating symbol - S

RODDING EYES



Our systems can be used to solve draining problems in different industrial areas (hospitals, hotels, restaurants, chemical and pharmaceutical plants). Rodding eyes are manufactured in austenitic stainless grades AISI304 or AISI316. Edge finishing allows installation in different types of floor.

We offer rodding eyes for severage tubes from DN110.

Symbol	Catalogue number	Dimensions [mm]	
Rw 150/110	050110 - *	DN	110
		W	150
		H	150
Rw 200/110	05110 - *	DN	110
		W	200
		H	150
Rw 200/160	051160 - *	DN	160
		W	200
		H	140
Rw 250/160	052160 - *	DN	160
		W	250
		H	140
Rw 250/200	052200 - *	DN	200
		W	250
		H	140
Rw 300/160	053160 - *	DN	160
		W	300
		H	140
Rw 300/200	053200 - *	DN	200
		W	300
		H	140

RODDING EYES



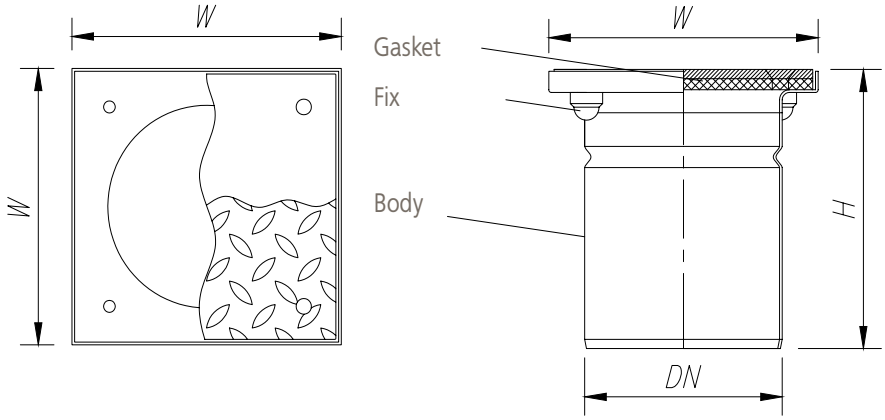
ADVANTAGES

- high durability.
- isolating from foreign odors.
- easy installation.
- good fit with interior design.

INSTALATION

1. Make sure the drain pipe is at the correct height.
2. During concrete pouring, the upper part should be 1-1,5 [mm] below floor level.

RODDING EYES



COVER TYPES

Anti-slip cover

Smooth cover



ANTI-SLIP COVER



SMOOTH COVER



RODDING EYES COMPONENTS

- body,
- screw lock cover,
- gasket.

LINEAR DRAINAGE



STANDARD CHANNELS



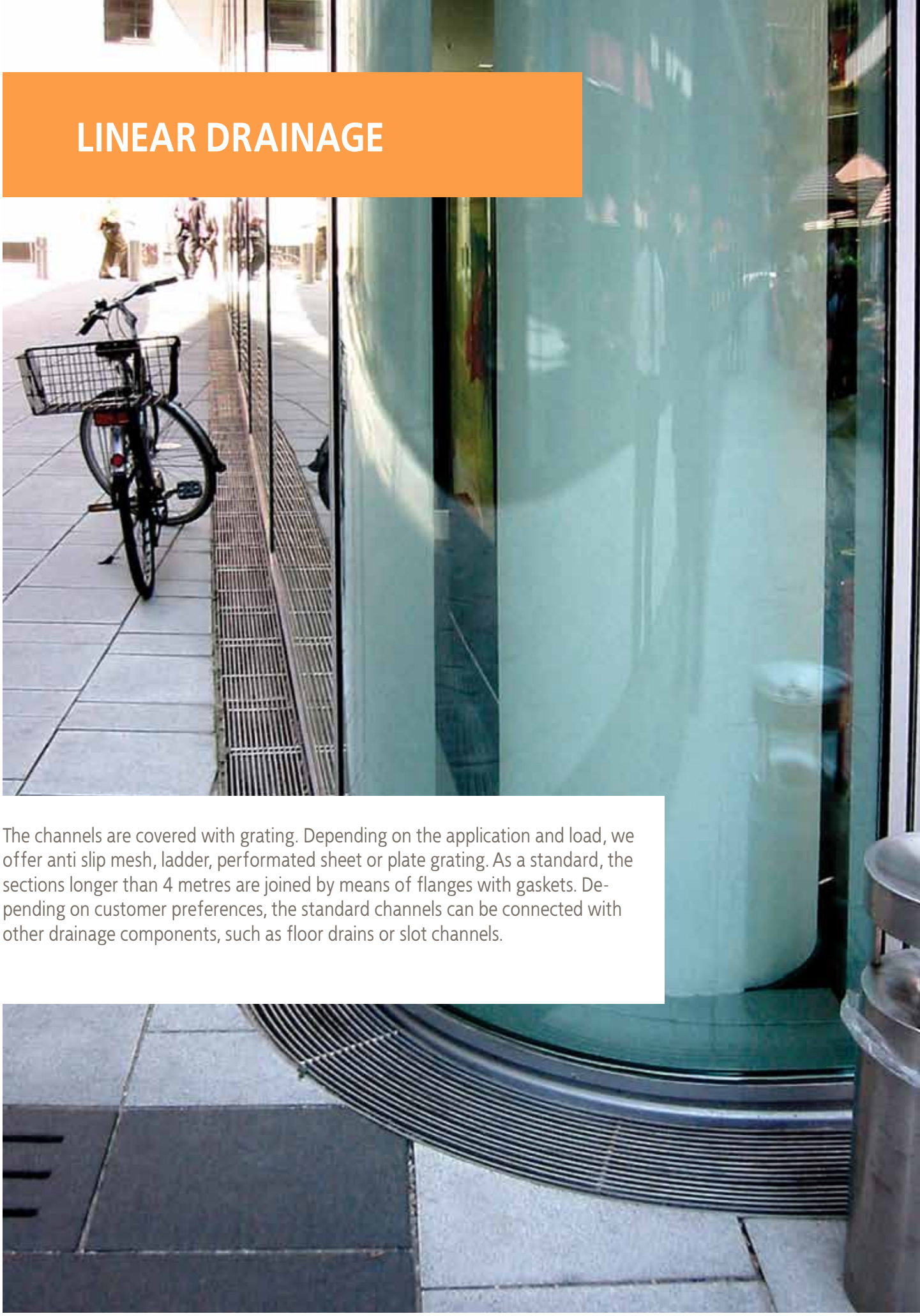
Standard channels are made of stainless steel and they are used to drain water from the floor and discharge it to the sewerage. This type of drainage finds application in food processing plants (breweries, dairy plants, slaughterhouses), chemical plants, restaurants, hospitals etc. They are also used in the facilities, where the sanitary regulations and technological process require using stainless steel drainage systems.

MANUFACTURING TECHNOLOGY

The standard drainage channels are manufactured in a wide range of sizes and shapes. They are made "to order"; the custom-made drawing is prepared as a result of cooperation between the client, its design or process engineer and the ATT staff. As a standard, the channels are made of 2 [mm] AISI 304 or AISI 316 sheets. The channels have in-built inclination.
To facilitate installation, each channel is equipped with levelling bolts and anchoring elements for correct height adjustment and placement in concrete.



LINEAR DRAINAGE



The channels are covered with grating. Depending on the application and load, we offer anti slip mesh, ladder, performated sheet or plate grating. As a standard, the sections longer than 4 metres are joined by means of flanges with gaskets. Depending on customer preferences, the standard channels can be connected with other drainage components, such as floor drains or slot channels.

STANDARDS CHANNELS



ADVANTAGES

- draining a large amount of water,
- are easily configurable and can be joined at a required angle with other standard or slot channels,
- can be covered with a variety of gratings ,
- easy access in cleaning purposes (rounded internal edges, replaceable gratings, trapped waste basket),
- the channel edges can be adapted to floor type (additional tile flanging, angle for expansion joints),
- the rodding eye to the sewer is located in the outlet.

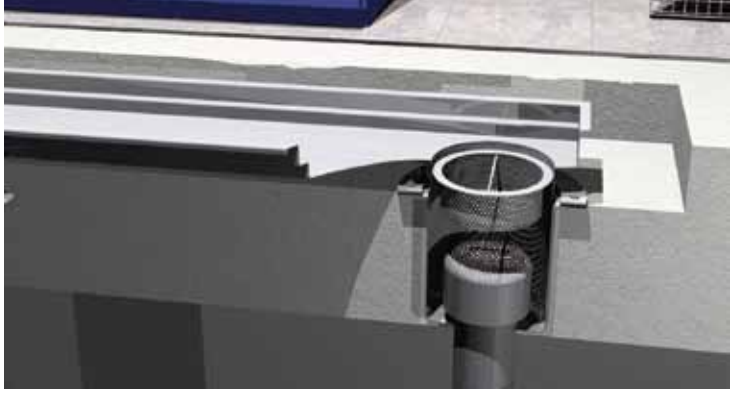
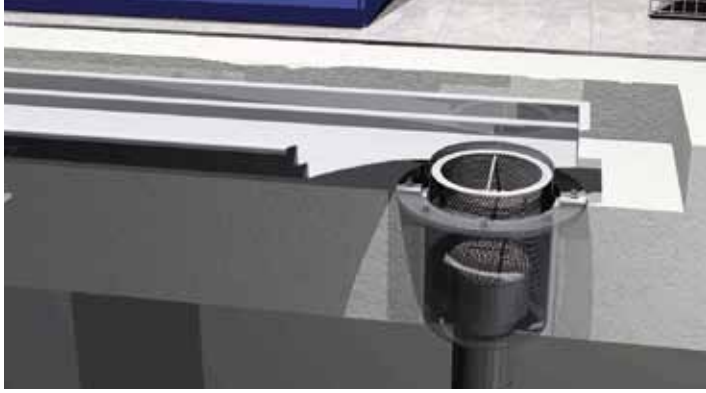
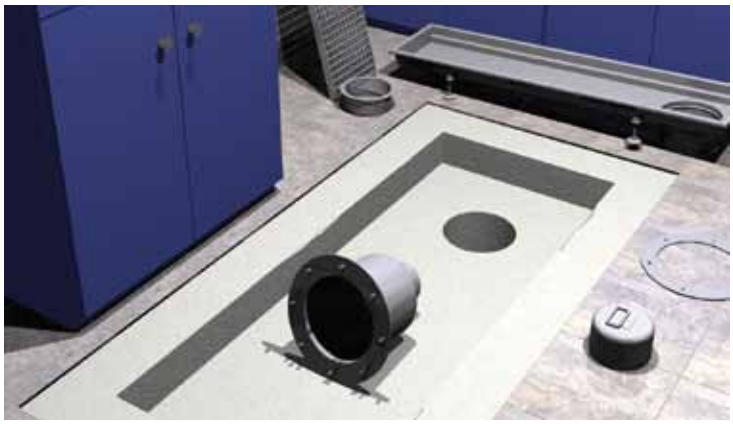
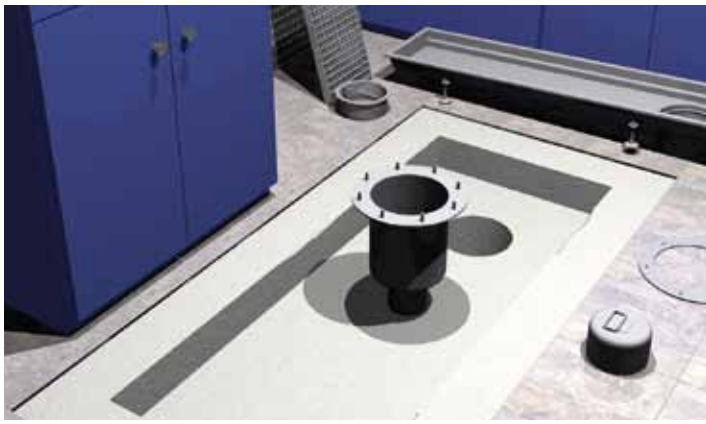
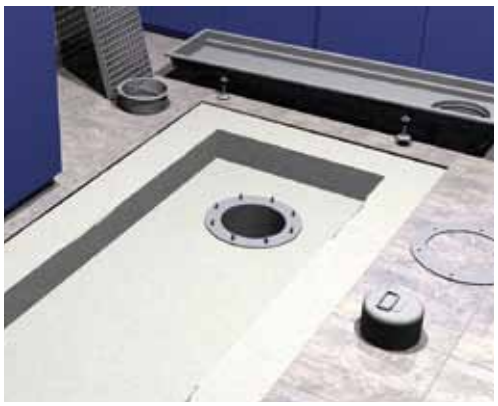
DESIGN SYMBOLS

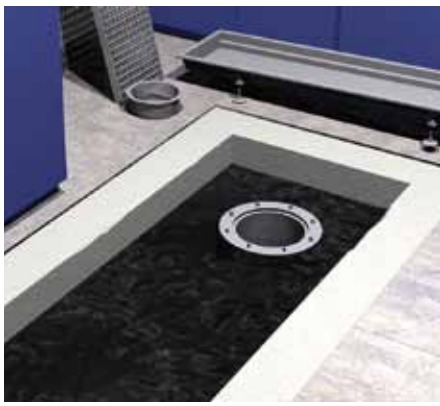
The standard channels are designated by their external width (S150, S200, S220.....S600..... etc.).

EXAMPLE

S150 channel with the 150 [mm] external width.

For the S150 channel, the grating width will be 110 [mm], and the clearance 80[mm].
In addition to the width, the channel parameters should also include type and degree of fall and the drawing of the channel route in the plan.







STANDARD CHANNEL

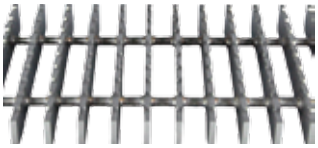
GRATINGS

The most typical grating to cover the standard channels is the anti-slip mesh grating with 23 x 23 [mm] mesh size and the load-bearing angle 25 x 2 or 30 x 2[mm]. Our product range also includes the ladder, plate or perforated sheet gratings, all in different sizes and dimensions.

The grating type is selected according to the channel location, load and functionality requirements. In the areas where forklift trucks traffic is intense, we recommend the plate grating, whereas mesh type is preferable, if the amount of the water to be drained is significant.



perforated sheet grating



ladder hygienic grating



anti-slip mesh grating



plate grating

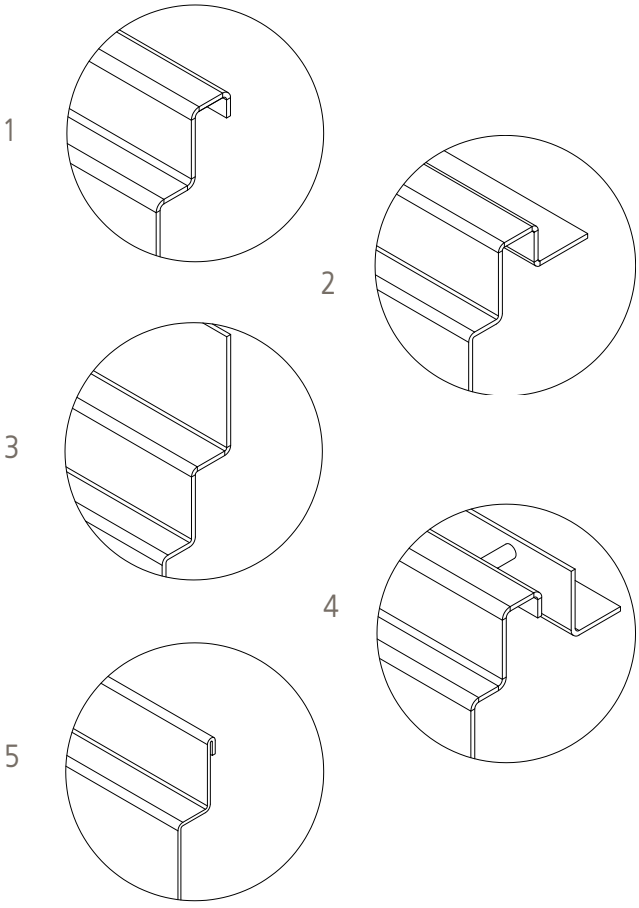


ladder grating

CHANNEL EDGE FINISHING

The edge finishing should depend on the flooring and wastewater temperature.
We can offer the following options:

1 - with downward flange (standard)
2 - with flange
3 - with raised back edge
4 - with edge angle section for expansion joint in the floor
5 - with tightly folded edges



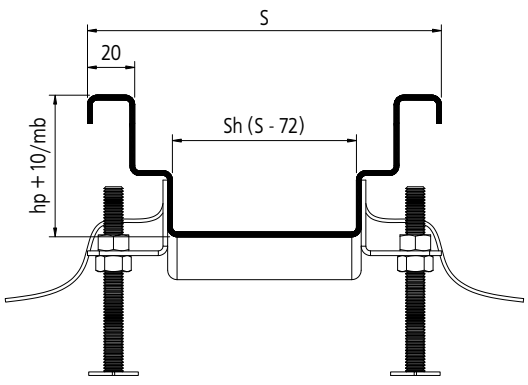
STANDARD CHANNELS

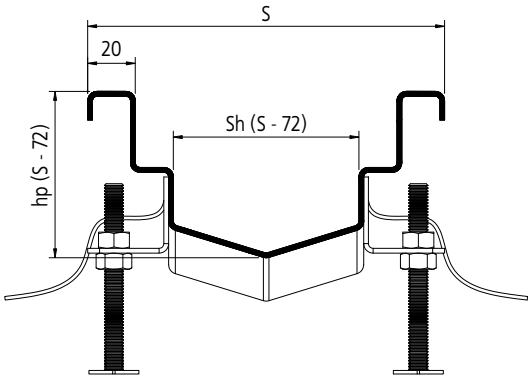
Typical layout of the channel is shown in the figure below. The placement of floor drains and the channel route depends on the needs and the amount of water to be drained from the floor. The two systems we offer standard and slot channels can be combined.

The channel route should be decided by the design engineer in cooperation with the process engineer. In case of any technical questions relating to the drainage system, please do not hesitate to contact our consultants.

The channel outlet is fitted with trap and waste basket, securing the sewage system from solid impurities. We can insert horizontal isolation into the flange the floor drain is fitted with. This solution assures leak tightness in the area of outflow passage through the floor.

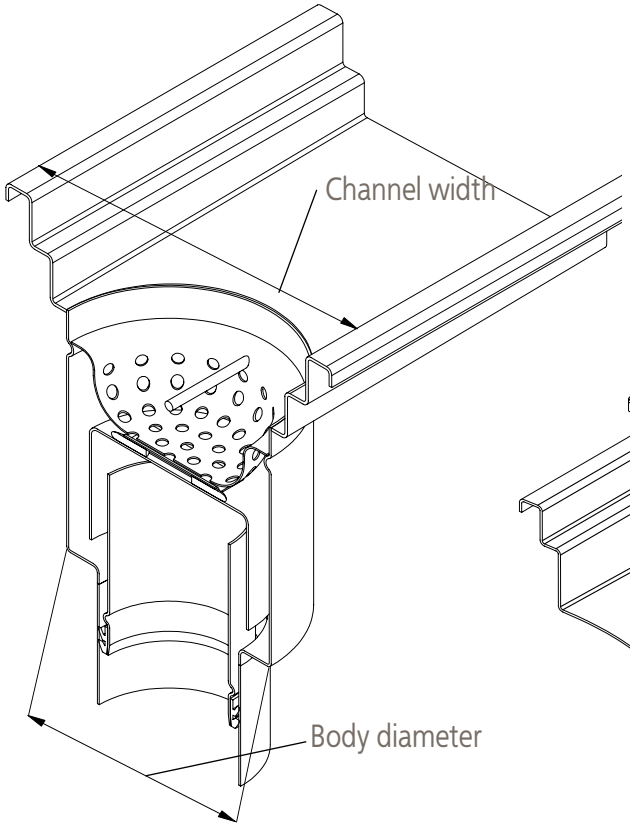


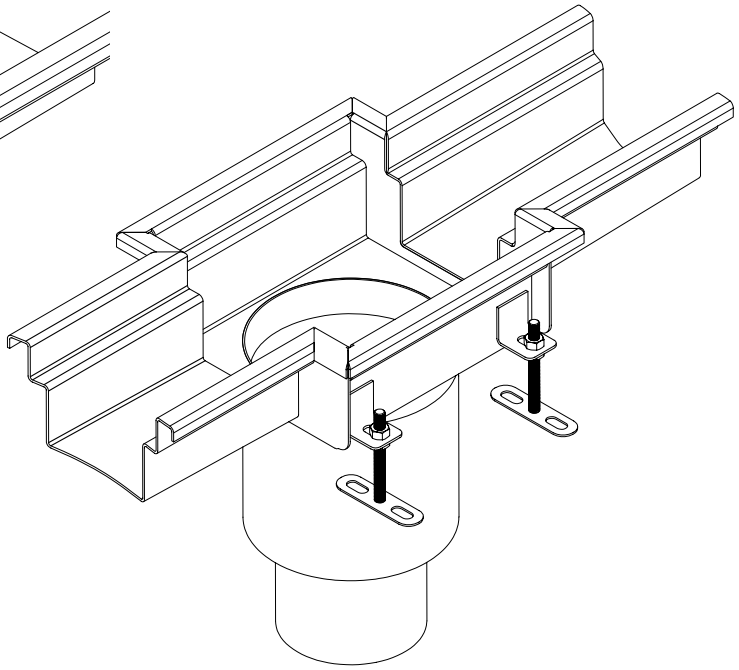




hp – initial channel height, channel's bottom fall depends on needs and installation abilities

STANDARD CHANNEL





The table below shows standard dimensions of channel extension depending on type of used outlet. The extension is always 10 mm deeper than the channel it is connected to.

Due to the fact that the grating has bearing elements of one direction only, the extension is asymmetrical, which prevents incorrect installation.

Outlet type	Outlet diameter [mm]	Body diameter [mm]	Extension size (length x width) [mm]	Channel without extension		Flow rate (1/s)
				Min. channel's width [mm]	Min. Hydraulic width [mm]	
Wm150,200/110V1/2,H1/2	110	110	205x200	S190	120	0,5
W200/110V1p,H1p	110	157	245x240	S240	170	2,2
W200/110V2p,H2p	110	142	245x240	S220	150	2,2
W250/110V1,H1	110	193	275x270	S270	200	3
W250/110V2,H2	110	172	275x270	S250	180	3
W300/160V1,H1	160	255	340x335	S330	260	9
W300/160V2,H2	160	234	340x335	S310	240	9
W400/200V1,H1	200	348	435x430	S430	350	12
W400/200V2,H2	200	308	435x430	S390	320	12

V1 vertical floor drain single part

V2 vertical floor drain two - part

H1 horizontal floor drain single part

H2 horizontal floor drain two part

SLOT CHANNEL





ADVANTAGES

- good match to the interior design,
- cheaper option in comparison to standard drainage channels,
- possible connection to other channel types,
- grating is not required,
- easy installation.

A cheap and simple method for draining the surfaces where high flow capacity is not required. A perfect solution for rooms with condensate dripping from machinery or A/C systems: bakeries, dairies and swimming pools, as a separation of wet and dry areas.

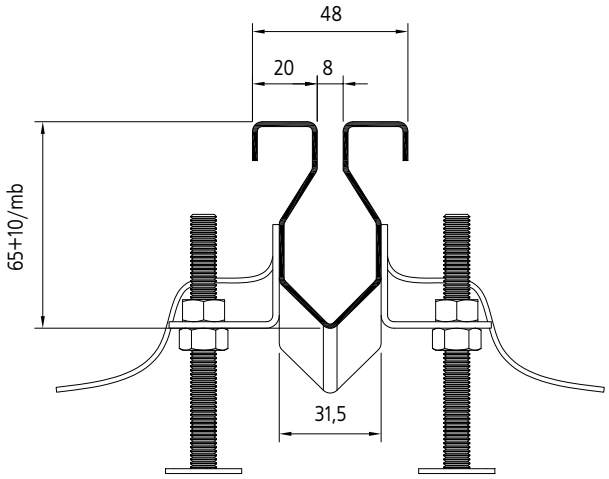
MANUFACTURING TECHNOLOGY

The slot drainage channels are made of 1.5-2 [mm] sheets. They feature inclination and can be adapted to the floor thickness. Water drainage from the slot channel can be via a stub pipe or the trapped floor drain with a waste basket. Standard length of a channel with a single outlet should not exceed 10 [m]. The channel sections exceeding 4 [m] in length are joined by means of flanges with gaskets.

SLOT CHANNELS

MINI SLOT CHANNEL

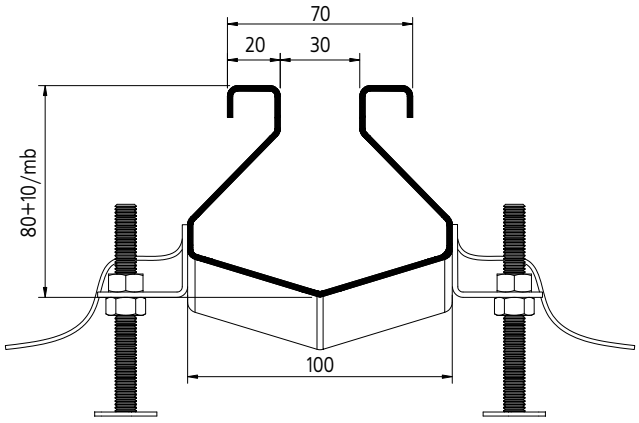
The mini slot channels are made of the 2 [mm] sheet. The channel is not covered with any grating and it is characterised by higher hydraulic efficiency against the standard channel. It has smaller inlet opening and clearance. It is used in the places where smaller amount of water need to be drained.



Mini slot channel

MAXI SLOT CHANNELS

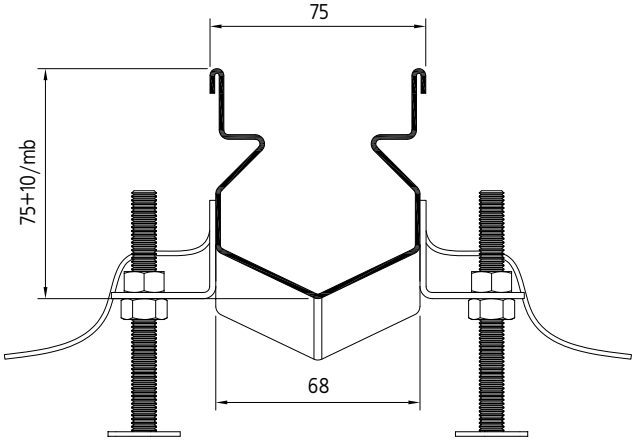
The maxi slot channels are made of the 2 [mm] sheet. This channel does not require grating, and features higher flow capacity than standard channels. One of its characteristic features is larger inlet opening and clearance. Used wherever there amount of wastewater to be drained is substantial and standard channel does not need to be used due to the production process requirements (absence of large solids).



Maxi slot channel

STANDARD MINI CHANNEL

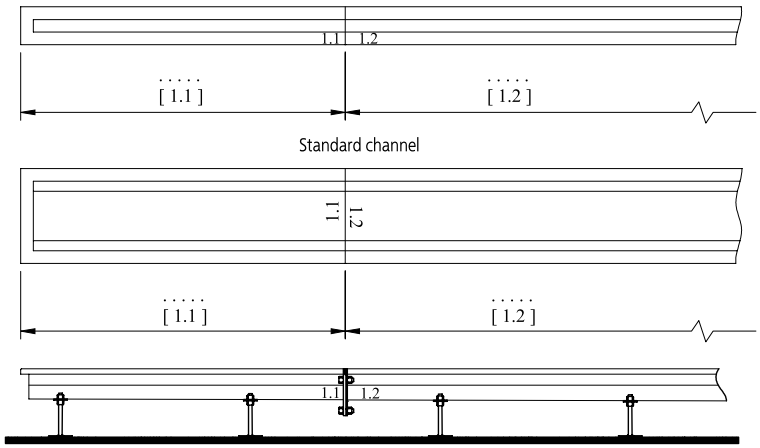
The standard mini channel combines the advantages of the standard and slot channels. It has small dimensions and features gratings. These channel types are used wherever the amount of water to be drained is small, but the rodding eye is necessary. As a standard, such channels are made of 1.5-2 [mm] V2A or V4A sheets.

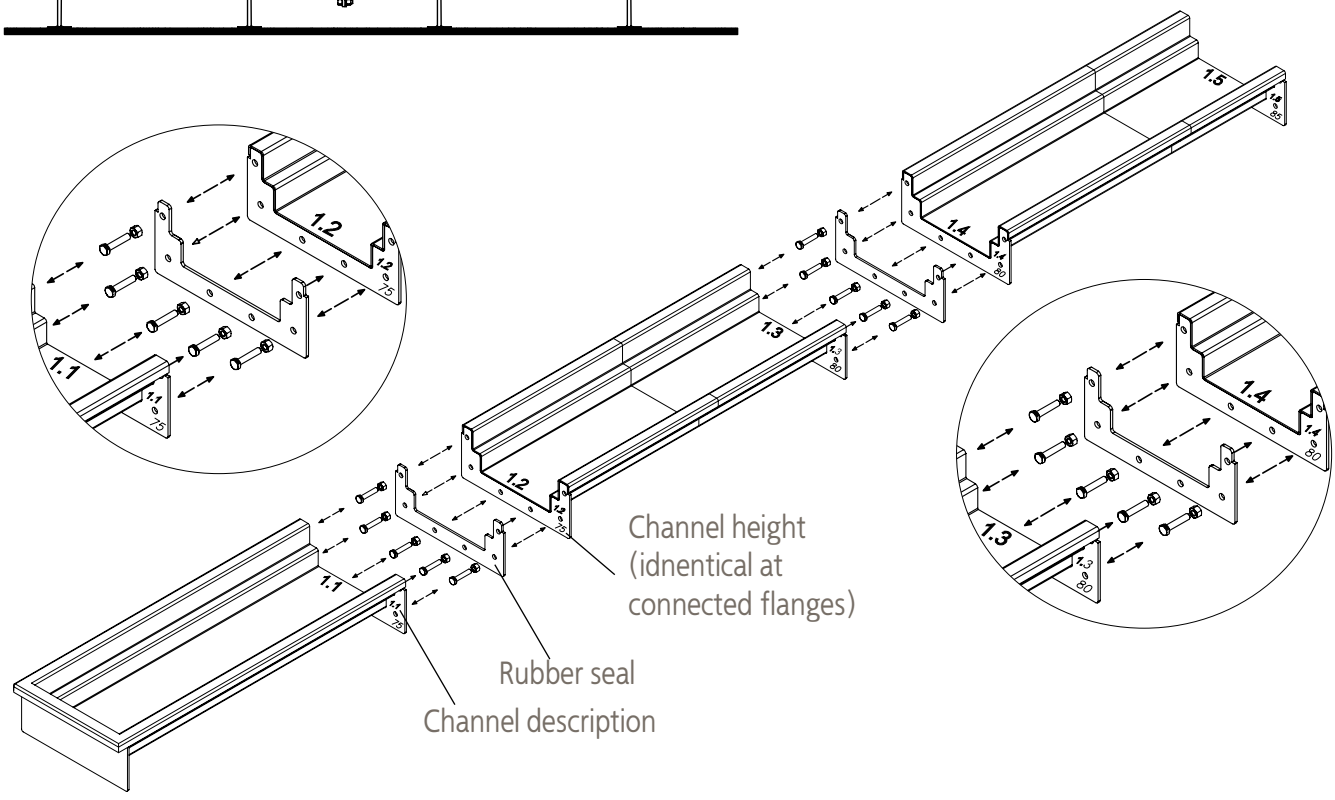


Standard mini channel

LINEAR DRAINAGE

CHANNEL CONNECTION DRAWING





Channel runs are divided into sections appropriate for transport, as a standard their length does not exceed 4 or 6 meters.
Length of the sections also depends on manufacturing technology.

At the connection point the channel is approximately 25 mm lower, due to the presence of the rim. It is also possible to weld the channel directly at the construction site.

LINEAR DRAINAGE

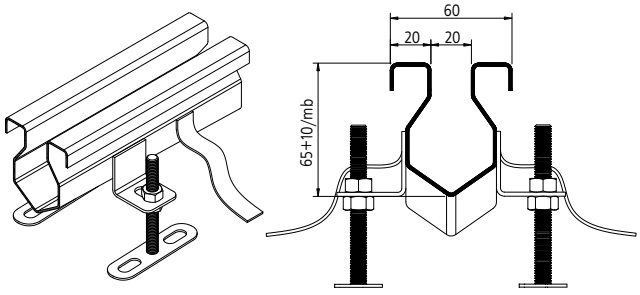


CHANNEL INSTALLATION

1. Before installing the channel, bolt all its parts according to the "installation guide" to ensure tightness of all flange connections (flange-gasket--flange).
2. Install the channel prepared as above in the sewer service pipe's spigot.
3. The next step involves placing of the channel on the required level. The channel edge should be 1-1.5 [mm] below the floor level.
4. When the channel is stabilized, we recommend to secure it against displacement during concrete pouring.
5. Pour concrete on the leveling legs and anchoring elements.
6. In hard to access areas subjected to highest loads, insert the concrete with a spatula.
7. Make sure the elements are clean, free of dirt. Remove gratings, waste baskets and traps.

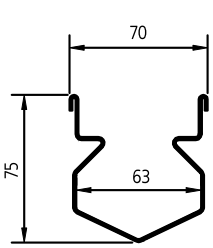
CHANNEL DEPTH

At the channels made with the bottom fall, the depth of the channels increases with its length. The channel depth at the outlet depends on the initial height, length and the channel fall.
Standard initial depth of the slot channel is 65 [mm], bottom fall equals 1% and the opening width is 20 [mm]. These parameters can be customized to meet the client's requirements.

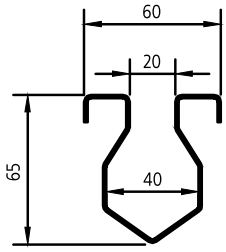


LINEAR DRAINAGE

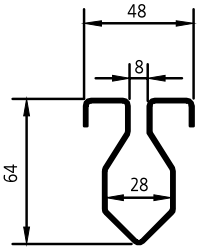
MINIMUM INITIAL HEIGHTS FOR STANDARD AND SLOT CHANNELS



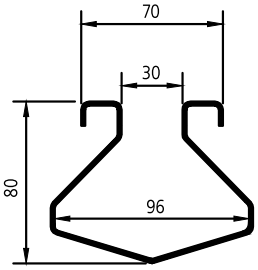
Standard mini channel



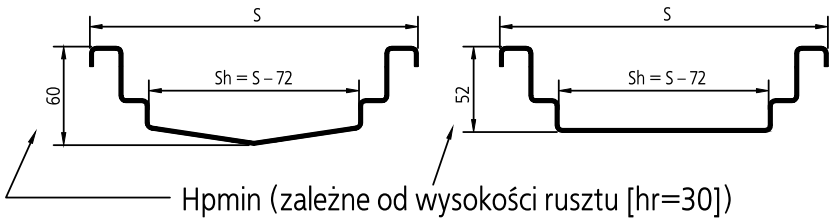
Slot channel



Mini slot channel



Maxi slot channel



Section of channel with sectional bottom

Section of channel with flat bottom

EDGES FILLING

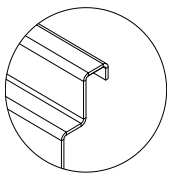
Standard edge (without backfilling).

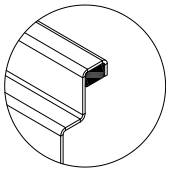
Edge backfilled with syntetic material. It facilitates installation and prevents formation of a void between the concrete and the edge, protecting the channel perimeter against deformation in case of large loads.

Edge backfilled with stainless steel. The edge backfilled with a steel profile should be used in the areas with intensive traffic and high loads.

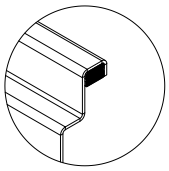
Edge with a border angle section. The angle is connected with the channel edge by means of a bar. This edge type is used to make expansion joints along the channel, i.e. when the drained wastewater is hot.

Edge with a strip for vinyl flooring. The strip is installed on the channel edge to ensure tight joint between the channel and the vinyl flooring.

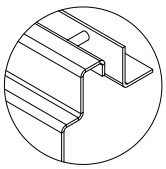




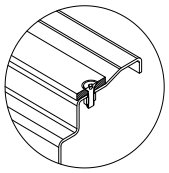
syntetic material



stainless steel

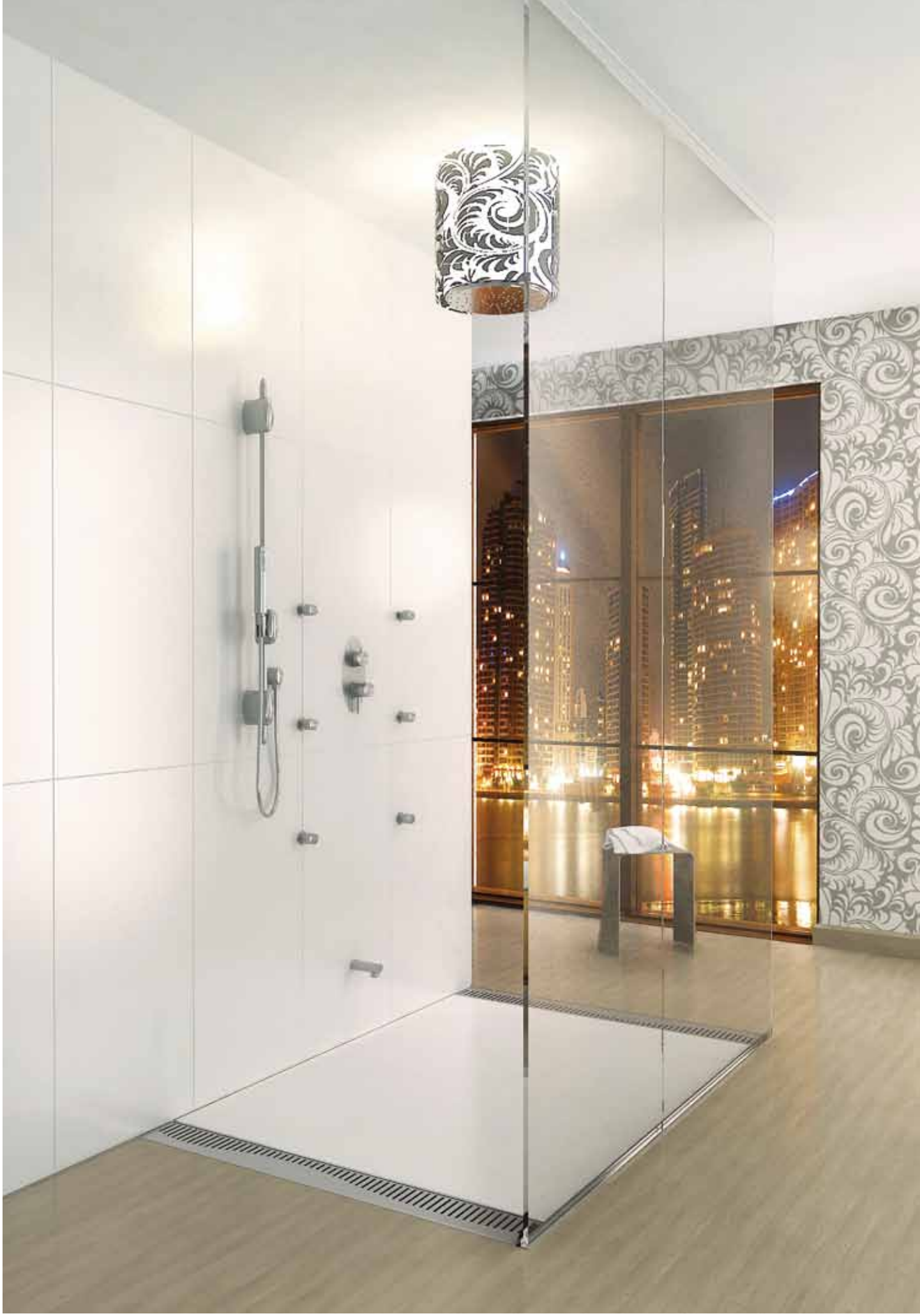


angle section



strip for vinyl floor

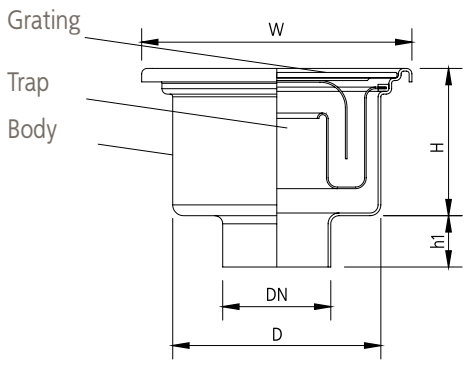
BATHROOM SOLUTIONS



BATHROOM FLOOR DRAINS



BATHROOM FLOOR DRAINS WL100/40 WITH VERTICAL OUTLET



Symbol		WI100/40V1
Catalogue number mat. 304		00.063040.02 - *
Dimensions [mm]	DN	40
	H	54
	H1	-
	h1	20
	D	77
	W	100x100
	hr	2

Number or symbol of the floor drain needs to be completed with the proper grating symbol.



Cerchio - grating symbol C



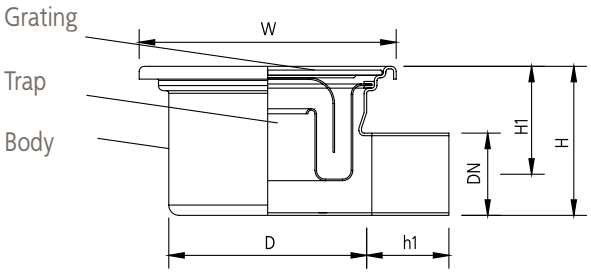
Fiore - grating symbol F



Goccia - grating symbol G

BATHROOM FLOOR DRAINS

BATHROOM FLOOR DRAINS WL100/32 WITH HORIZONTAL OUTLET



Symbol		WI100/32H1
Catalogue number mat. 304		00.064040.02 – *
Dimensions [mm]	DN	32
	H	58
	H1	42
	h1	30
	D	77
	W	100x100
	hr	2

Number or symbol of the floor drain needs to be completed with the proper grating symbol.



Cerchio - grating symbol C



Fiore - grating symbol F

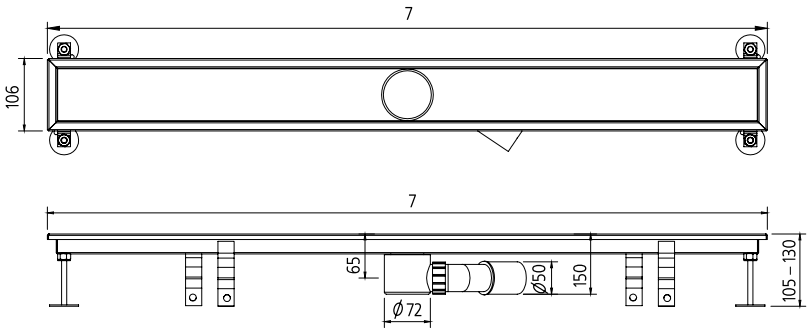


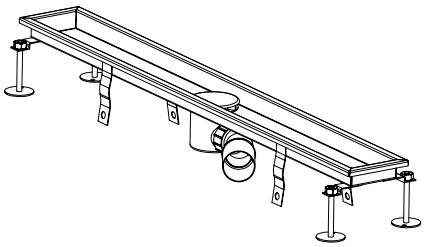
Goccia - grating symbol G

SPA CHANNELS



STANDARD CHANNEL





length	polished	sand-blasted
	catalogue no.	catalogue no.
700 mm	00.106007.01-*	00.106007.02-*
800 mm	00.106008.01-*	00.106008.02-*
900 mm	00.106009.01-*	00.106009.02-*
1000 mm	00.106010.01-*	00.106010.02-*
1200 mm	00.106012.01-*	00.106012.02-*

Catalogue number needs to be completed with the grating symbol given below:


Balena – B


Murena – M

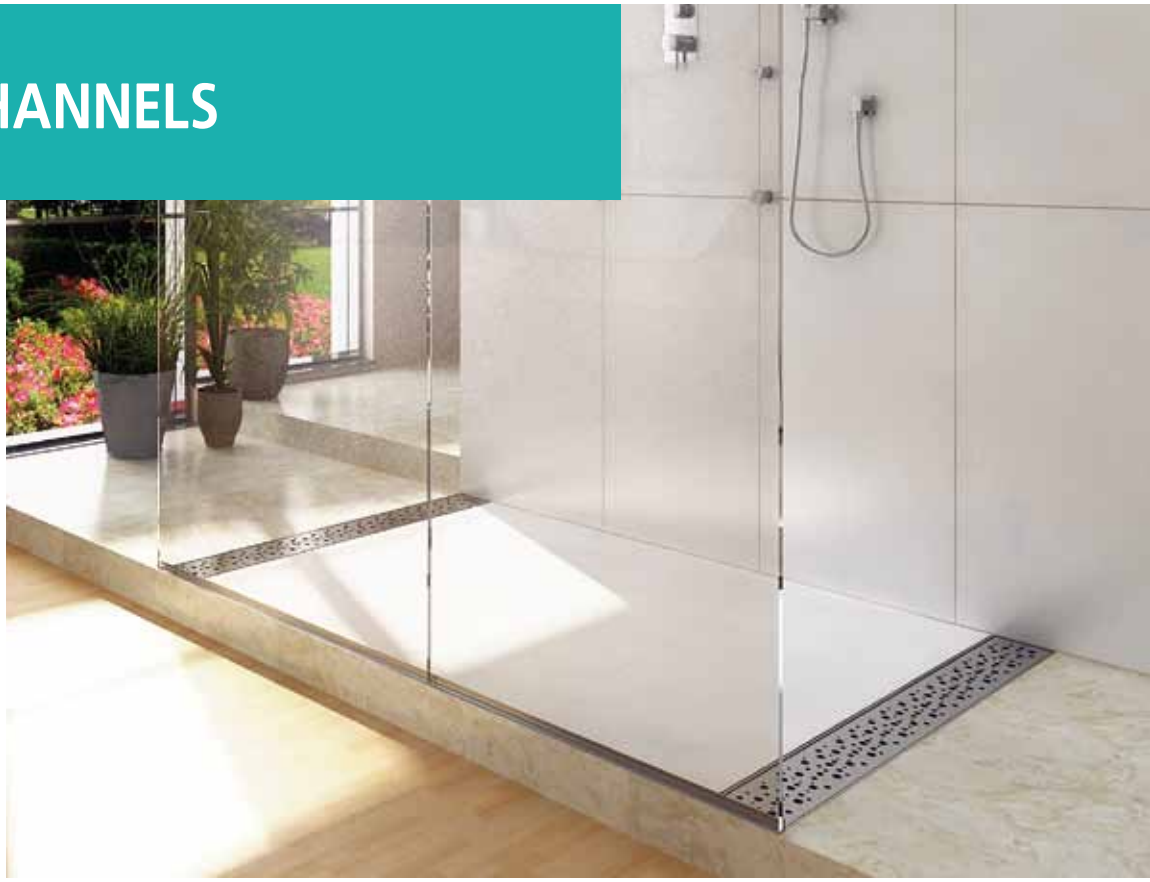

Spigola – S


Goccia – G

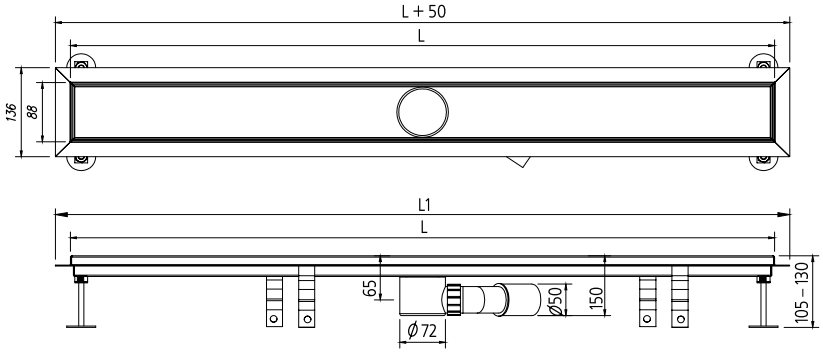

Vipera – V

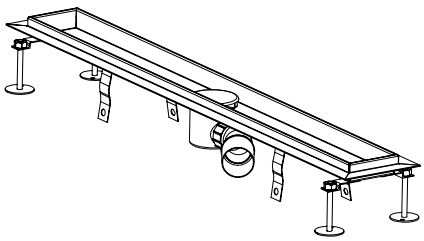

Pietra – P

SPA CHANNELS



CHANNEL WITH FLANGE





length	polished	sand-blasted
	catalogue no.	catalogue no.
700 mm	00.088007.01-*	00.088007.02-*
800 mm	00.088008.01-*	00.088008.02-*
900 mm	00.088009.01-*	00.088009.02-*
1000 mm	00.088010.01-*	00.088010.02-*
1200 mm	00.088012.01-*	00.088012.02-*

Catalogue number needs to be completed with the grating symbol given below:


Balena – B


Murena – M


Spigola – S

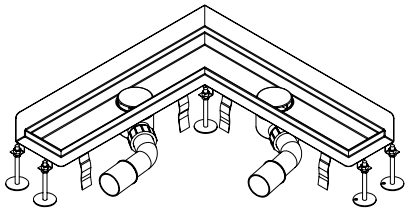

Goccia – G

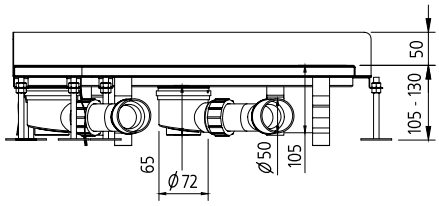

Vipera – V

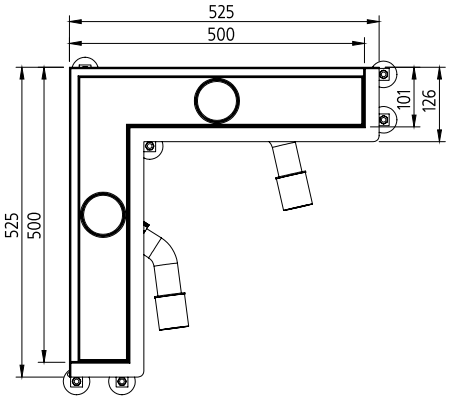

Pietra – P

SPA CHANNELS

CORNER CHANNEL

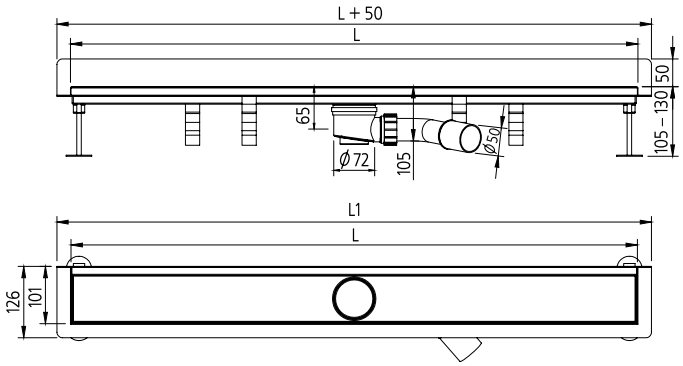


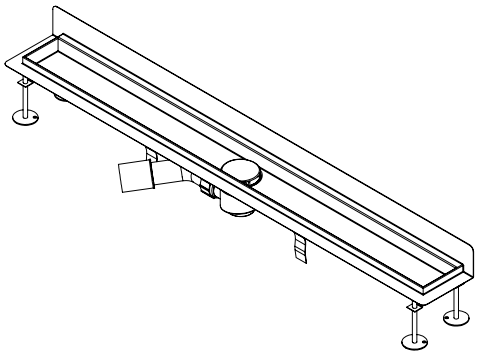




length	polished	sand-blasted
	catalogue no.	catalogue no.
500x500 mm	00.101005.01-*	00.101005.02-*

CHANNEL WITH RISED BACK EDGE





length	polished	sand-blasted
	catalogue no.	catalogue no.
700 mm	00.100007.01-*	00.100007.02-*
800 mm	00.100008.01-*	00.100008.02-*
900 mm	00.100009.01-*	00.100009.02-*
1000 mm	00.100010.01-*	00.100010.02-*
1200 mm	00.100012.01-*	00.100012.02-*

Catalogue number needs to be completed with the grating symbol given below:


Balena – B


Murena – M


Spigola – S


Goccia – G


Vipera – V


Pietra – P

SHOWER BASE

Shower base is made of stainless steel AISI 304.
We use 1.25 [mm] thick decorative metal panel as a production material.
Circle-style pressing finishing ensures the required rigidity of the construction and it also gives the steel anti-slippery attribute.
Runoff to the sewage system is possible through regular bathroom outlets available on the market.

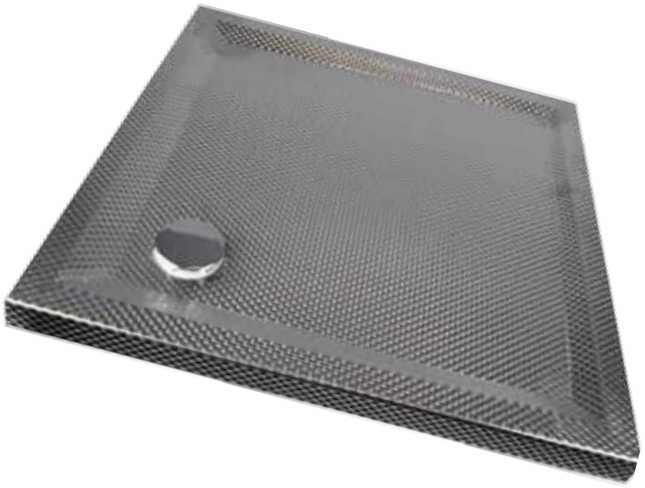
APPLICATION

- all places for disabled people such as health centers, hospitals, rehabilitation facilities,
- bathroom furnishing for premises, sport centers, production halls.

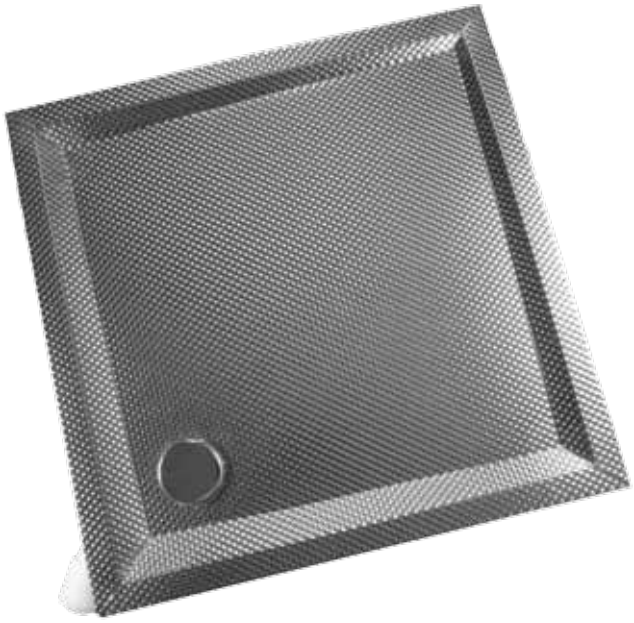
ADVANTAGES

- easy to clean,
- possiblity of using all sorts of disinfectants,
- antibacterial feature of stainless steel,
- comfortable wheelchair entry to shower enclosure without meeting any obstacles on the way,
- easy installation,
- aesthetic look.

catalogue number	dimensions [mm]	height [mm]
00.208008.07	800 x 800	40
00.209009.07	900 x 900	40



STAINLESS STEEL SHOWER BASE



MANHOLE COVERS



MANHOLE COVERS



Manhole covers come in different shapes and sizes. They are used in industrial and public buildings, i.e. shops, exhibition halls, restaurants, warehouses etc., where it is necessary to have access to the systems installed under the floor. The manhole cover can be finished with floor tiles, terra cotta etc.

The manhole covers are made of the V2A steel and are 3 [mm] thick, which allows for installing them in the areas where sanitary requirements are very strict.

TYPES OF MANHOLE COVERS

Standard manhole covers – consist of upper and lower parts, bolting for safe and stable closing and the 'black steel' reinforcement.

Gas-tight manhole covers - additionally feature an O-ring between the lower and upper **part.**

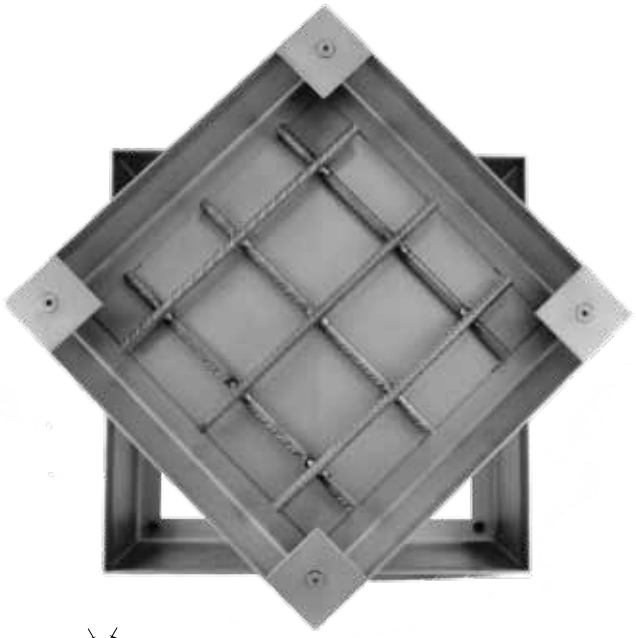
ADVANTAGES

- easy access to the systems installed under the floor,
- isolating from outside odours,
- water tightness,
- easy opening,
- high durability,
- aesthetics.

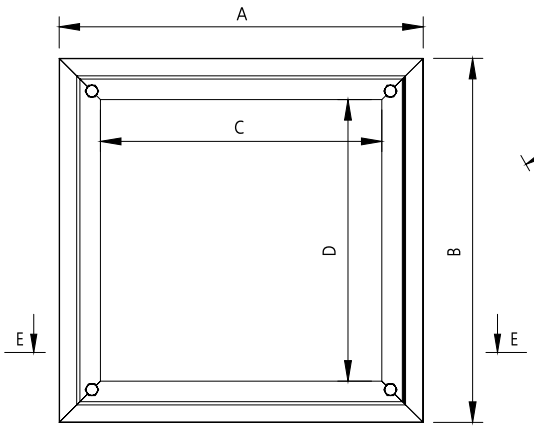
MANHOLE COVERS

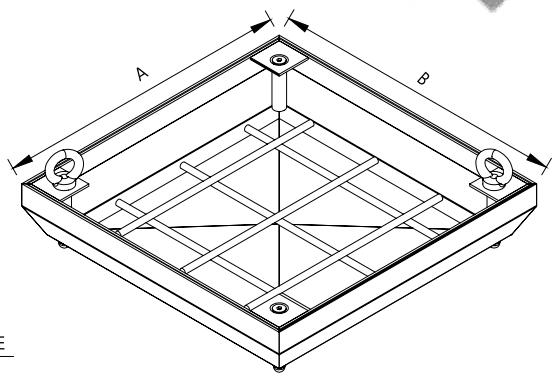


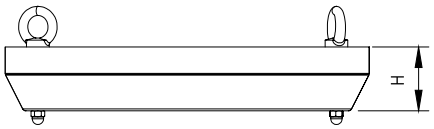
MANHOLE COVERS

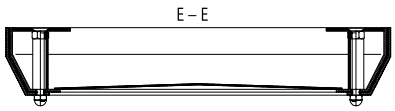


DIMENSIONS OF STANDARD MANHOLE COVERS









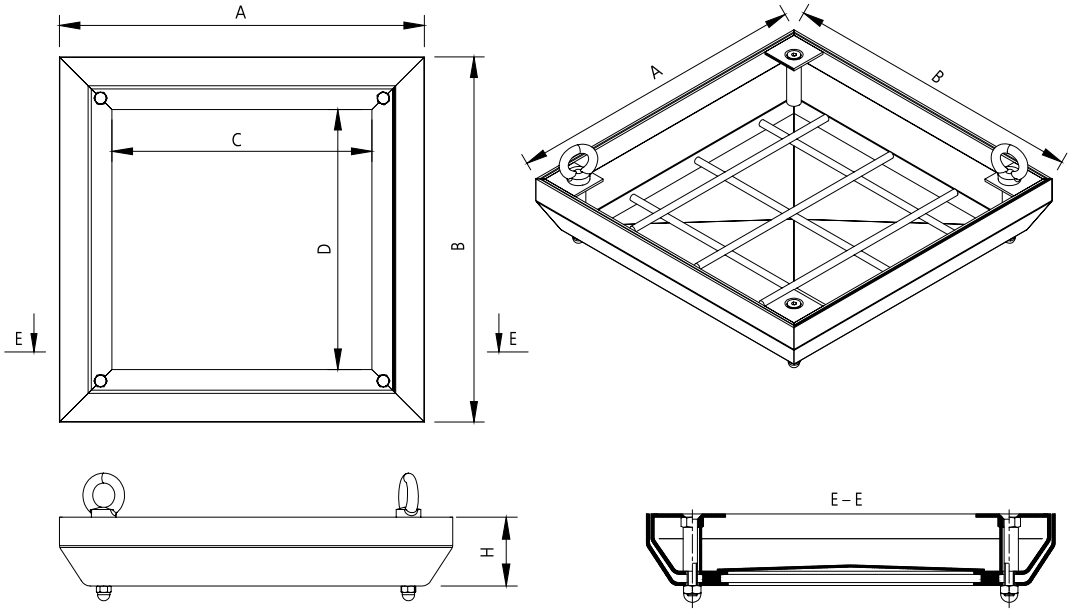
cover type	standard manhole cover	outside dimension A x B [mm]	inside dimensions C x D [mm]	height H [mm]
K 3x3	00.071033.00	300x300	160x160	70
K 4x4	00.071044.00	400x400	260x260	70
K 5x5	00.071055.00	500x500	360x360	70
K 5x7	00.071057.00	500x700	340x540	85
K 6x6	00.071066.00	600x600	440x440	85
K 6x8	00.071068.00	600x800	440x640	85
K 7x7	00.071077.00	700x700	540x540	85
K 8x8	00.071088.00	800x800	620x620	100
K 9x9	00.071099.00	900x900	720x720	100
K 10x10	00.071010.00	1000x1000	820x820	100

Ø10 bar is used for all types of manhole covers made of carbon steel.

MANHOLE COVERS



DIMENSIONS OF GAS-TIGHT MANHOLE COVERS

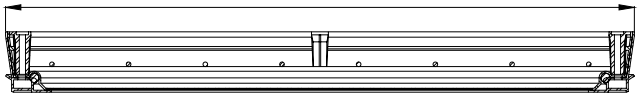


cover type	gas-tight manhole cover	outside dimension A x B [mm]	inside dimensions C x D [mm]	height H [mm]
K 3x3	00.070033.00	300x300	160x160	70
K 4x4	00.070044.00	400x400	260x260	70
K 5x5	00.070055.00	500x500	360x360	70
K 5x7	00.070057.00	500x700	340x540	85
K 6x6	00.070066.00	600x600	440x440	85
K 6x8	00.070068.00	600x800	440x640	85
K 7x7	00.070077.00	700x700	540x540	85
K 8x8	00.070088.00	800x800	620x620	100
K 9x9	00.070099.00	900x900	720x720	100
K 10x10	00.070010.00	1000x1000	820x820	100

Ø10 bar is used for all types of manhole covers made of carbon steel.

MANHOLE COVERS

Aluminum manhole covers are available in different shapes and sizes. They are used in industrial objects and public buildings, i.e. shops, exhibition halls, restaurants, warehouses etc., where it is necessary to have access to the systems installed under the floor. The manhole cover can be finished with floor tiles, terra cotta etc





cover type	gas-tight aluminium manhole cover	outside dimension A x B [mm]	inside dimensions C x D [mm]	height H [mm]
K 3x3	00.080033.00	320x320	200x200	77
K 4x4	00.080044.00	420x420	300x300	77
K 5x5	00.080055.00	520x520	400x400	77
K 6x6	00.080066.00	620x620	500x500	77
K 7x5	00.080075.00	720x520	600x400	77
K 7x7	00.080077.00	720x720	600x600	77
K 8x8	00.080088.00	820x820	700x700	77
K 9x7	00.080097.00	920x720	800x600	77
K 9x9	00.080099.00	920x920	800x800	77
K 11x7	00.080017.00	1120x720	1000x600	77
K 11x9	00.080019.00	1120x920	1000x800	77
K 11x11	00.080011.00	1120x1120	1000x1000	77

The following installation requirements must be met for the manhole to be used successfully:

1. During installation, the lower and upper part must be joined.
2. To avoid frame distortion (which can seriously damage the products and make it unable to use) place the distance pieces between the edges of upper and lower part.
3. Level and place the cover on previously made manhole.
4. The cover is stabilized with concrete with plastic consistency.
5. The upper part with reinforcement should be filled with the B30 or higher concrete class, depending on the dimensions and load.
6. The concrete should be poured to the height that enebles future installation of the floor.

MEDIA BOXES

Used in the areas where it is necessary to have access to telephone or electrical cables installed in the floor. The junction boxes can be used in public buildings, supermarkets, shopfloor, warehouses and other places, where a periodic need to connect a device or open a sales stand. The boxes are made of V2A or V4A steels. The body has the thickness of 2 [mm] and the cover with 5 [mm] lid.

All components are welded in the argon shield, subsequently etched and anti-corrosion protected. The box features glazed cover with a bolted gasket and swinging lid. Lid closing secures the box against unauthorised entry.



SK2



SK1

We manufacture single-chamber boxes SK1, double-chamber SK2 and bespoke multi-chamber on request.

Note!
The dimensions shown in the table below are for guidance purpose only and can be modified on Customer's request.

type	catalogue number	outside dimension A x B [mm]	inside dimension C x D [mm]	height H [mm]
SK-1	90001	168x300	114x242	70
SK-2	90002	300x300	242x242	70

SMALL ARCHITECTURE ELEMENTS



LAWN EDGING



Lawn edgings are made of stainless steel AISI 304. They are used as a flexible separation of green areas in parks and gardens.

CHARACTERISTIC

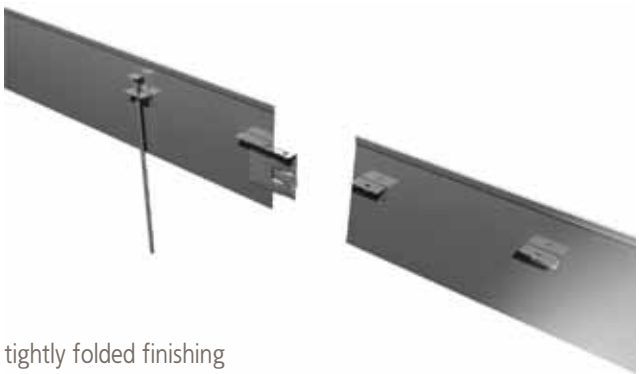
- flexibility,
- durability and resistance to fertilizers,
- sharp or tightly folded edges,
- simple installation using stainless steel special profile pins,
- standard height, wide scope of length.

STANDARD DIMENSIONS

- production length: 500, 1000, 1500, 2000, 3000 mm,
- width 175 mm,
- metal sheet thickness: 1; 1.5 mm.

* There is possible to modify dimensions and the thickness of metal sheet according to individual Clients' requirements.

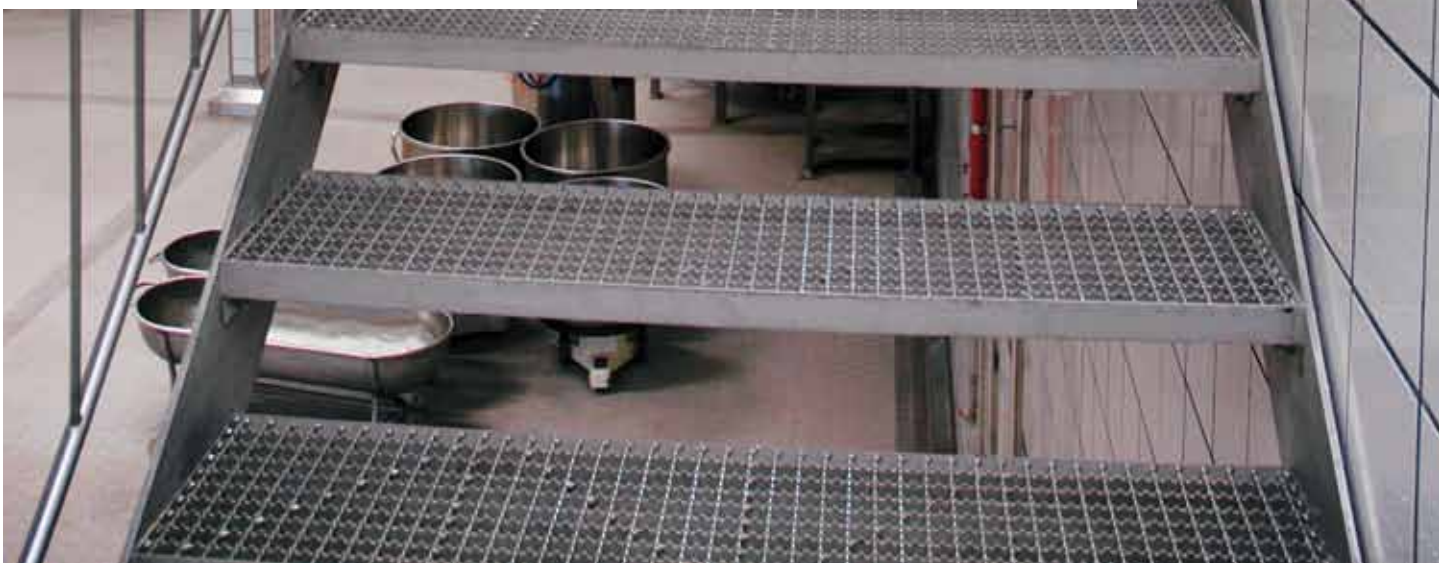
length [mm]	height [mm]	sheet thickness [mm]	catalogue number	
			sharp edges	tightly folded edges
500	175	1	00.175005.01	01.175005.01
1000	175	1	00.175010.01	01.175010.01
1500	175	1	00.175015.01	01.175015.01
2000	175	1	00.175020.01	01.175020.01
3000	175	1	00.175030.01	01.175030.01
500	175	1,5	00.175005.02	01.175005.02
1000	175	1,5	00.175010.02	01.175010.02
1500	175	1,5	00.175015.02	01.175015.02
2000	175	1,5	00.175020.02	01.175020.02
3000	175	1,5	00.175030.02	01.175030.02



tightly folded finishing

PLATFORM GRATING AND STEPS

Platform grating elements and steps manufactured by our company are widely used for constructing platforms, landings, internal and external staircases, foot-paces, gangways, hatch covers, inlet covers and protective grates, access ways for handicapped people at hotels, traffic routes at pipelines and reservoirs, walkways of footbridges, etc.



PLATFORM GRATING AND STEPS

These products are used in all kinds of construction projects, irrespective of the industry branch, improving work safety and comfort and also easily blending into the surroundings.

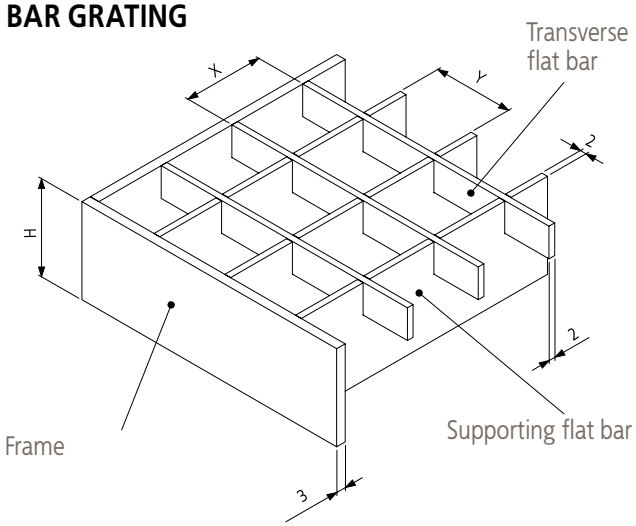
Our products, manufactured of stainless steel, meet high strength standards, are resistant to unfavorable environmental conditions, are maintenance-free, guarantee work safety and stability. The feeling of stability is also important from psychological viewpoint, especially for users of platforms and gangways constructed in high locations.

WE OFFER TWO KINDS OF PLATFORM GRATINGS

Stainless steel bar grating – transverse bars are titghtly fit in supporting bars and afterwards welded in a 3 [mm] thick frame.

Serrated grating – thanks to cuts applied on supporting bars, serrated gratings are characterized by increased friction coefficient - it improves their anti--slip properties. Serrated grating are used in a places threatened by the presence of snow, ice, humidity or lubricants.

BAR GRATING



height H [mm]	dimension X [mm]	dimension Y [mm]
20/25/30/40	12,5	25
20/25/30/40	25	25
20/25/30/40	33	33



PLATFORM GRATING AND STEPS



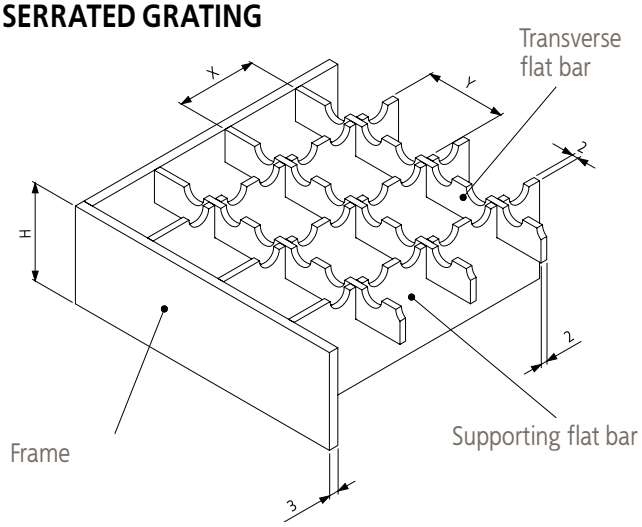
DESCRIPTION

Supporting flat bars – flat bars that carry the load of grating and are placed vertically at equal distances from each other.

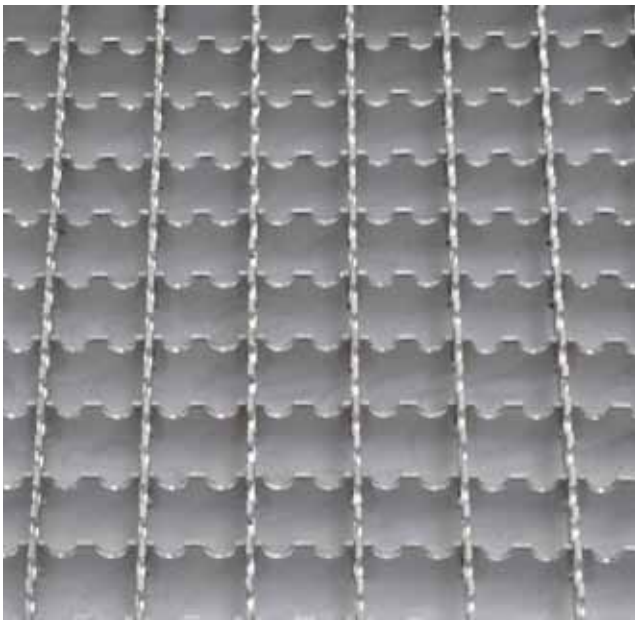
Transverse flat bars – link all supporting bars by their tight fitting in slots and by welding.

Mesh size – distance between axes of adjacent supporting and transverse bars.

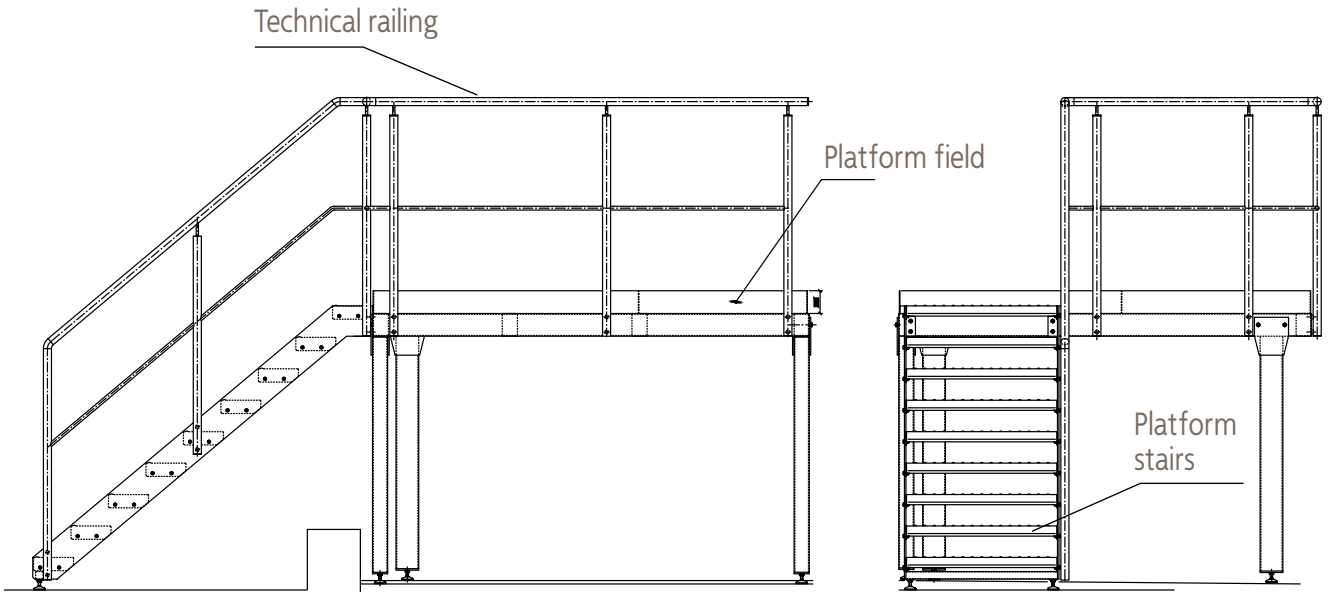
SERRATED GRATING



height H [mm]	dimension X [mm]	dimension Y [mm]
20/25/30/40	12,5	25
20/25/30/40	25	25
20/25/30/40	33	33

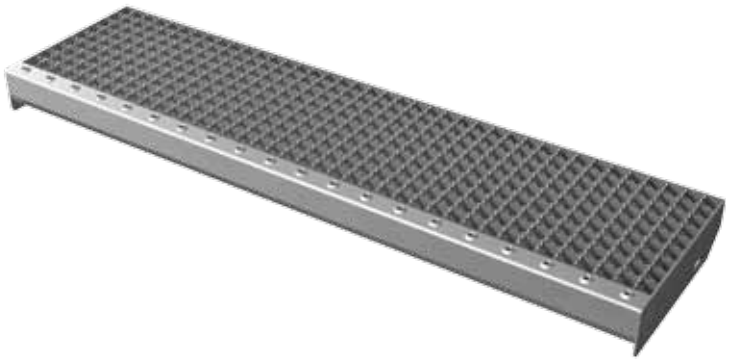


PLATFORM GRATING AND STEPS



DIMENSIONS OF STEPS [mm]

L	600			800			900			1000			1200		
B	240	270	305	240	270	305	240	270	305	240	270	305	240	270	305
h	supporting flat bars dimensions														
n	120	150	180	120	150	180	120	150	180	120	150	180	120	150	180



STAINLESS STEEL STEPS

Steps can be constructed using platform grating, however the step is fitted with special side framing that enables fast and easy assembly to the supporting structure.

It is also fitted with anti-slip front panel with special perforation on the upper surface. Appropriate profile of the strip also stiffens the structure of the step itself. Steps can be manufactured in any dimensions.

L - carrying lenght
B - step's width
h - step's height
n -holes spacing

PLATFORM GRATING AND STEPS

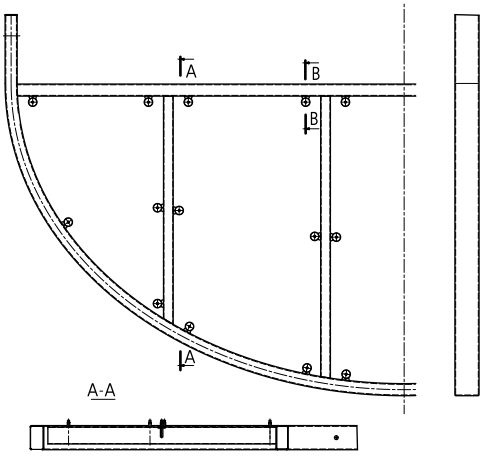


ROOFS

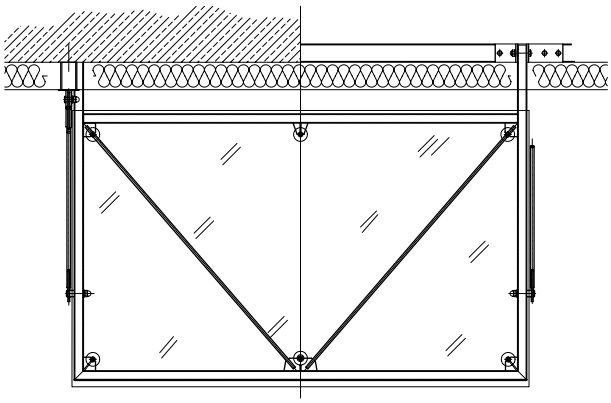


half-round roof

CONSTRUCTION OF HALF-ROUND ROOF



CONSTRUCTION OF RECTANGULAR ROOF



Rectangular roof



ATT roofs combine practical and aesthetic function of entrances to any building.
The roofs solutions offered by us, including bracing elements, are made of stainless steel. These are products of exceptional quality and durability, which guarantee long lifetime. They are available upon special order.

STEEL PLATES



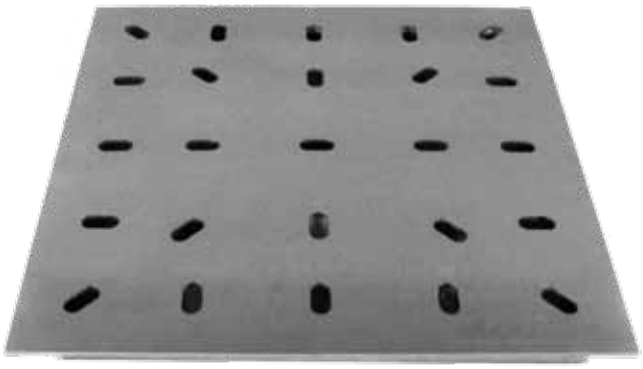
ATT steel plates are made of 2 [mm] thick stainless steel. They are resistant to any damages and breakages that occur in any industry or transport. Having considered the highest quality and aesthetics standards that need to be kept by our products, as well as hygienic and ecological requirements imposed by e.g. food industry, we introduced anti-corrosion, aesthetic and durable stainless steel products.

APPLICATION

- heavy industry plants,
- food industry plants,
- production halls,
- warehouses, storage yards,
- printing houses,
- loading ramps,
- foundries, steel plants.

ADVANTAGES

- high durability,
- safety,
- lack of work connected to floor renovation,
- technical advice during the whole order processing time,
- installation on Customer's request.



FURNITURE



FURNITURE

All furniture is made of stainless steel and meets the most rigorous sanitary requirements. As such, it is perfect choice for food processing, pharmaceutical and chemical industries, restaurants etc.

The basic range is as follows:

- tables (for carcass partitioning, auxiliary, for packing, with edge and drainage, with drawers),
- tables-cum-cabinets (with swinging doors, drawers),
- cabinets (ordinary, material),
- small tables (standing, on castors).

Widened range includes amongst others:

- pallets,
- pallet boxes,
- transporting counters,
- abattoir bathtubs,
- containers,
- bespoke, customized elements according to Clients' design and specification.

We can also offer you the professional consulting services to help you choose the best solution. On top of that, the non-standard components can be modified (in terms of dimensions, finishing or structural reinforcement).





ORDINARY CABINETS

catalogue number	width [mm]	depth [mm]	height [mm]
Sz80/180	800	600	1800
Sz80/210	800	600	2100
Sz100/180	1000	600	1800
Sz100/210	1000	600	2100

MATERIAL CABINETS

catalogue number	width [mm]	depth [mm]	height [mm]
SzM80/180	800	600	1800
SzM80/210	800	600	2100
SzM100/180	1000	600	1800
SzM00/210	1000	600	2100

NOTE! the dimensions can be modified on Customers' request.

FURNITURE

TABLES CARCASS PARTITIONING

catalogue number	width [mm]	depth [mm]	height [mm]
SJ50/85	600	500	850
SJ60/85	700	600	850
SJ70/85	800	600	850
SJ80/85	900	600	850



TABLES WITH SINKS

catalogue number	width [mm]	depth [mm]	height [mm]
SS140/70	1400	700	850
SS160/70	1600	700	850
SS180/70	1800	700	850
SS200/70	2000	700	850
SS220/70	2200	700	850



TABLES CUM-CABINETS WITH SWINGING DOORS

catalogue number	width [mm]	depth [mm]	height [mm]
SzSD120/70	1200	700	850
SzSD140/70	1400	700	850
SzSD160/70	1600	700	850
SzSD180/70	1800	700	850
SzSD200/70	2000	700	850



TABLES- CUM-CABINETS WITH DRAWERS

catalogue number	width [mm]	depth [mm]	height [mm]
SzSS120/60	1200	600	850
SzSS160/60	1600	600	850
SzSS200/60	2000	600	850
SzSS120/70	1200	700	850
SzSS160/70	1600	700	850
SzSS200/70	2000	700	850



NOTE! The dimensions can be modified on Customers' request

NOTES

NOTES

We reserve the right to make modification in this catalogue, including change in price, content, description at any time without previous notice.

ATT Sp. z o.o.

Tempat Sabun Dexon

